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THE OPEN UNIVERSITY
FACULTY OF BUSINESS AND LAW

PhD Thesis

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BSc. Hons (Applied Accounting)

MBA (Finance)

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MRes (Business and Management Research Methods)

**Internal Corporate Governance Mechanisms and the
Performance of Firms in the Context of the Recent Financial
Crisis: Evidence from the UK**

**Submitted for the degree of Doctor of Philosophy in
Finance**

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Abstract

Various theories that underpin corporate governance research predict that strong internal corporate governance mechanisms enhance the operating and financial performance of firms. These theories also predict that strong internal corporate governance mechanisms would increase firms' chances of survival during a financial crisis. This thesis tests these theoretical claims and makes a contribution by analysing the underlying governance-performance relationship from multiple theoretical perspectives (i.e. agency theory, stewardship theory and resource dependence theory) across three time periods. Adopting an index-based approach, the thesis investigates the impact of non-compliance with the UK corporate governance code on the performance of firms. The thesis also contributes to methodological approaches in this context by investigating the impact of non-compliance on the survival of firms during the financial crisis. Applying fixed and random effects models, a sample of 274 UK listed firms is analysed for the period 2003–2010.

The results show that non-compliance is, unexpectedly, positively associated with the performance of non-financial firms. This indicates that non-compliant firms outperformed compliant firms. However, although statistically not significant, the results also show that for non-financial firms, non-compliance decreases a firm's chances of survival during the financial crisis. For financial firms the results are mixed for different measures of performance and across different time periods. The thesis extends knowledge of the governance-performance relationship by showing that non-compliance has different implications for firms across different time periods and industries.

The thesis makes another contribution to knowledge by investigating the relationship between individual corporate governance mechanisms and performance. In this regard, it makes three contributions. First, it shows that board independence is negatively associated with performance, which supports the stewardship theory. For non-financial firms as predicted by resource dependence theory board independence is positively associated with performance only in the crisis period. Second, it provides evidence that extra board committees are negatively associated with the performance of firms and renders support to the agency theory. Third, it shows that internal control mechanisms are positively associated with performance in the period before the financial crisis, but during the financial crisis they negatively affect the performance of firms in both financial and non-financial sectors. This finding supports the two alternative views from the agency theory perspective in this context.

These results demonstrate the benefits of the 'comply or explain' principle of corporate governance which provides firms with a choice either to comply with the recommended codes or explain their non-compliance. The results also imply that the effect of various corporate governance mechanisms on the performance of firms varies between the financial and non-financial sectors. Finally, the results imply that the governance-performance relationship is very complex and could be better explained by adopting multiple theoretical perspectives rather than using a single theory to understand it.

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Chapter 1 Introduction

1.1 Background of the study

The association between corporate governance¹ mechanisms and the performance of firms has been the focus of many research studies over the last four decades. The corporate governance-performance research originates from the way modern day business entities (particularly large limited liability companies) are set up. The ownership structure of these business entities, as well as how these businesses are run and controlled has major implications for its owners and other stakeholders (for example, creditors, employees, government agencies, suppliers etc.).

In modern day organisations, the professional managers who control the resources of a business are separate from its owners, the latter of whom ultimately own the resources. This separation of ownership and control in modern corporations is labelled as the principal-agent relationship (Jensen and Meckling, 1976) . The principal-agent relationship gives rise to costs (referred to as agency costs) which could include, the costs arising from inefficient use of resources, monitoring costs incurred by owners, or business resources being used by managers for personal gains (Jensen and Meckling, 1976) . Agency costs at any level mean a decrease in shareholders' wealth. Therefore, it is in the best interest of shareholders to keep these agency costs at the lowest possible level in order to maximise their wealth.

¹ The various definitions of corporate governance are discussed in Section 2.1.

To keep agency costs under control and minimise their negative effect on shareholders' wealth, different mechanisms² are put in place both inside and outside organisations. Corporate governance is one of these mechanisms, with its purpose being to enhance economic efficiency and protect the interests of organisations' stakeholders (Kay, 1996, Walker, 2009).

Different corporate governance systems have been used to improve firm level corporate governance. These corporate governance systems can be classified into two categories. The first system is rules-based, for example Sarbanes-Oxley Act 2002 in the USA. Under this system of corporate governance, every listed company must comply with the required corporate governance practices. In the case of failure to comply, the companies can face penalties, such as delisting from the stock exchange.

The second system of corporate governance is known as the principles-based system. This system of corporate governance was first introduced in the UK in the early 1990s, and is now in place in most countries around the world in Europe, America, Asia, and Africa. This system of corporate governance is based on the principle of 'comply or explain'. The 'comply or explain' principle requires companies either to comply with the recommended corporate governance practices, or if the companies choose not to comply then they are required to provide explanations for the non-compliance in their annual reports.

Since the introduction of these different corporate governance systems, researchers have studied its implications for firms from different perspectives. Some studies have been carried out to investigate how the compliance with these recommended corporate governance practices affects the operating and financial performance of firms, whilst

² These mechanisms are discussed in detail in Section 2.1.

others have investigated the impact of individual corporate governance mechanisms on the performance of firms.

In the UK context, and since the introduction of the Cadbury report in 1992, some studies have investigated the impact of these governance codes on firms' corporate governance structures (Weir and Laing, 2000, Dedman, 2002). Other studies have focused on how compliance with these individual governance codes affects the performance of firms (McKnight et al., 2009). In addition, some studies have also investigated how level of compliance with the UK corporate governance code affects the performance of firms (MacNeil and Li, 2006, Shabbir and Padgett, 2008).

However, the results of this existing research are inconclusive. Studies carried out in different parts of the world and in different time periods produce mixed results. For instance, Gompers et al. (2003), Cremers and Nair (2005) and Bebchuk et al. (2009) report that corporate governance is positively associated with firm performance. However, other studies show that corporate governance is negatively associated with firm performance (e.g. Bauer et al., 2004, Core et al., 2006, Bhagat and Bolton, 2008). Moreover, some recent studies show that there is no association at all between corporate governance and firm performance (e.g. Daines et al., 2010, Fodor and Diavatopoulos, 2010, Price et al., 2011).

These conflicting results show that researchers have thus far been unable to establish and explain the association between corporate governance and firm performance. Therefore, the relationship between corporate governance and performance needs further investigation to understand why the existing research in this area is inconclusive. The study contributes to this debate by analysing one sample of firms over multiple time periods. This includes a time period of external shock (the financial crisis) and the use of more than one measure of performance to test robustness claims. Therefore, the results of this study

can shed some light on whether the mixed results in the existing literature are due to the use of different performance measures, different sample periods or the different geographical regions of the studies. It is possible that the results of this study will reveal that the association between governance and performance for the same sample of firms is affected by the different time periods or the various measures of performance used. If this is the case, then it could indicate that this relationship is influenced by other factors in the external operating environment (such as economic growth, customer base, nature of products, and technological changes etc.). This could provide some explanations for the mixed results in the existing literature.

Furthermore, the study also investigates the implications of corporate governance for firms during ‘the financial crisis’³. In the context of this study, the term financial crisis relates to the period from 2007 which initially saw financial markets become illiquid, thus triggering major problems for banking institutions in many economies. As a consequence of this weakness in the banking sector, economies all over the world witnessed marked reductions in economic activity. At the time of writing in 2012 this crisis is still continuing.

It is important to investigate the implications of corporate governance for the survival⁴ of firms during the financial crisis. Firstly, strong corporate governance mechanisms could contribute to better shareholder protection and improved economic performance (Shleifer and Vishny, 1997). Secondly, poor corporate governance mechanisms could play a role in the failure of firms (Cadbury, 1992, para. 1.9). If these

³ For the purpose of this study the financial crisis period started from July 2007 (Fahlenbrach and Stulz (2011), Aebi et al., (2012) and Beltratti and Stulz (2012)).

⁴ A firm is considered to have survived the financial crisis if, it did not receive any government bailouts (Adams, 2012) , or was still operating as a going concern by the end of 2010 (i.e. did not go bankrupt), or was not de-listed, or did not carry out any major corporate actions (e.g. mergers and acquisitions, and shares issues during or soon after the credit crunch of 2007-08).

arguments hold, then firms with strong corporate governance mechanisms would be better placed to survive during the financial crisis.

The UK context provides a good experimental set up in which to study the link between corporate governance and the performance of firms. First, and as stated earlier, the principles-based system of ‘comply or explain’ was first introduced in the UK. Similar to the UK, most countries around the world have also adopted the principles-based system of corporate governance. Therefore, results of the study could be generalised to other ‘comply or explain’ regimes around the world.

Second, there is a lack of studies which investigate the link between compliance with the UK corporate governance code and the performance of firms. The only study which is closely related to this research is Shabbir and Padgett (2008). However, Shabbir and Padgett (2008) analyse only non-financial firms for the period 2000–2004. In contrast, this study will analyse both financial and non-financial firms over an eight year period (i.e. 2003–2010), including a period of financial crisis 2007–2010. Furthermore, this is the first study of its kind to analyse the impact of the level of compliance with the UK corporate governance code on the survival of firms during the financial crisis.

The results of the study will shed some light on the importance of compliance with the recommended corporate governance practices for the performance of firms. By investigating this relationship over different time periods then conclusions can be drawn as to whether or not the association between governance and performance has changed over time.

1.2 Objectives of the study and research questions

The study attempts to achieve the following objectives. The first objective of the study is to analyse the association between the level of compliance with the UK corporate

governance code and the performance of firms. The level of compliance for each sample firm is calculated based on the 2003, 2006 and 2008 versions of the UK corporate governance code. A total of 22 corporate governance provisions are included in measuring the level of compliance for each firm. These provisions appear in all these codes. However, from time to time the Financial Reporting Council (FRC)⁵ revises these provisions. These revisions are taken into account in calculating the level of compliance for each firm. Table 1.1 outlines the principles of corporate governance included in the thesis.

Table 1.1 The principles of corporate governance included in the thesis

P1	Principle A.2 of the code states that there should be a clear division of responsibilities at the head of the company between the running of the board and the executive responsibility for the running of the company's business. No one individual should have unfettered powers of decision.
P2	Principle A.2.2 of the code states that the chairman should, on appointment, meet the independence criteria set out in Section A.3.1 of the UK corporate governance code.
P3	Principle A.3.3 states that the board should appoint one of the independent non-executive directors to be the senior independent director.
P4	Principle A.3.2 states that except for smaller companies ⁶ at least half of the board excluding the chairman should be Independent non-executive directors (INEDs).
P5	Principle A.3.2 states that the majority of non-executive directors (NEDs) should be Independent.
P6	Principles A.4.1, C.3.1, and B.2.1 state that the board should establish nomination, audit and remuneration committees.
P7	Principle A.4.6 states that a separate section of the annual report should describe the work of the nomination committee, including the process it has used in relation to board appointments.
P8	Principles A.4.1, C.3.1, and B.2 state that the audit, nomination, and remuneration committees should be headed by independent non-executive directors (INEDS).
P9	Principle A.4.5 states that executive directors should not take more than one non-executive directorship in a FTSE 100 company nor the chairmanship of such a company.
P10	Principle A.6.1 states that the board should report in the annual report how performance evaluation of the board, its committees and its individual directors

⁵ FRC is the regulatory authority responsible for developing the codes of corporate governance in the UK.

⁶ A smaller company is one that is outside the FTSE 350 throughout the year immediately prior to the reporting year.

	has been conducted.
P11	Principle A.6.1 states that independent non-executive directors led by senior independent director should be responsible for performance evaluation of the chairman, taking into account the views of executive directors.
P12	Principle A.7.1 states that all directors should be subject to election at their first AGM, and re-election every three years.
P13	Principle B.1.1 states that performance-related elements of remuneration should form a significant proportion of the total remuneration package of executive directors and should be designed to align their interests with those of shareholders and to give these directors keen incentives to perform at the highest levels.
P14	Principle B.1.2 states that remuneration for NEDs should not include share options.
P15	Principle B.2.1 states that remuneration committee should be entirely composed of independent non-executive directors.
P16	Principle C.2 states that the board should maintain a sound system of internal controls to safeguard shareholders' investments and the company's assets.
P17	Principle C.2.1 states that the board should, at least annually, conduct a review of the effectiveness of the company's system of internal controls and should report to shareholders that they have done so.
P18	Principle C.3.1 states that at least three members of the audit committee should be independent non-executive directors.
P19	Principle C.3.1 states that the board should satisfy itself that at least one member of the audit committee has recent and relevant financial experience.
P20	Principle D.1.2 states that the board should report in the annual report the steps taken to ensure that the board, including the NEDs, has developed an understanding of the views of major shareholders of the company.
P21	Principle B.1.6 states that notice or contract periods should be set at one year or less.
P22	Principle C.3.2 states that the main role and responsibilities of the audit committee should be set out in written terms of reference.

The second objective is to study how the association between corporate governance and performance is affected by severe economic conditions (i.e. the 2007–2008 financial crises). The third objective of the study is to analyse the association between the level of compliance with the UK corporate governance code and the survival of firms during the financial crisis.

The fourth objective of the study is to investigate how individual corporate governance mechanisms (such as, board size, board composition, directors' remuneration, directors' share ownership, and leverage) affect the performance of firms. This relationship is studied during different time periods i.e. before and during the financial crises. The fifth

and final objective of the study is to analyse the association between various corporate governance mechanisms and the survival of firms during the financial crisis.

Based on the above objectives, the study endeavours to answer the following research questions. First, how does level of compliance with the UK corporate governance code affect the performance of firms in financial and non-financial sectors? Secondly, does the overall economic environment affect the relationship between governance and performance? Thirdly, does the level of compliance with the UK corporate governance code affect the survival of firms during the financial crisis?

Fourthly, how do individual corporate governance mechanisms (such as board size, board independence, board remuneration, board committees, internal control mechanism in place, and leverage) affect the performance of firms? Fifthly, how does the overall economic environment (financial crisis) affect the relationship between these individual corporate governance mechanisms and the performance of firms? And finally, do these internal corporate governance mechanisms affect the survival of firms during the financial crisis? This study is unique as both financial and non-financial firms are analysed over the same time period. In addition, the study also takes into account the recent financial crisis which began in 2007–2008.

The above research questions are answered with the help of the following hypotheses. These hypotheses are tested in Chapter 4.

Table 1.2 Hypotheses of the study

Performance related Hypotheses	
H1a	There is a negative relationship between board size and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H2a	There is a positive relationship between the ratio of non-executive directors on the board and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H3a	There is a positive relationship between the overall level of compensation and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H4a	There is a positive relationship between directors' share ownership and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H5a	There is a negative relationship between extra board committees and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H6a	There is a positive relationship between internal controls and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H7a	There is a negative relationship between leverage and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H8a	There is a negative relationship between the level of non-compliance with the UK corporate governance code and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
Survival related Hypotheses	
H1b	There is a negative relationship between board size and firm survival during the financial crisis.
H2b	There is a positive relationship between the ratio of non-executive directors and firm survival during the financial crisis.
H3b	There is a positive relationship between the overall level of compensation and firm survival during the financial crisis.
H4b	There is a negative relationship between directors' share ownership and firm survival during the financial crisis.
H5b	There is a positive relationship between extra board committees and firm survival during the financial crisis.
H6b	There is a positive relationship between internal controls and firm survival during the financial crisis.
H7b	There is a negative relationship between leverage and firm survival during the financial crisis.
H8b	There is a negative relationship between non-compliance with the UK corporate governance code and firm survival during the financial crisis.

1.3 Motivation of the study

Major corporate failures around the world, such as Enron, Parmalat, Tyco, WorldCom, and Polly Peck among others, have been linked to poor internal corporate governance mechanisms. These major corporate failures have led to the introduction of corporate governance codes in various countries around the world. During the development of all these codes, one basic assumption is being made. This assumption is that strong internal corporate governance mechanisms could protect the interests of shareholders both in the short term as well as in the long term (Kay, 1996, Walker, 2009).

Internal corporate governance mechanisms could have the following implications for firms. First, strong internal corporate governance mechanisms would ensure that the company's free cash flows are returned to its shareholders as dividends rather than being expropriated by directors who exercise control over these free cash flows (Jensen, 1986, Shleifer and Vishny, 1997, La Porta et al., 2002). Strong internal corporate governance mechanisms could lead to increased monitoring and accountability. This would discourage managers from overinvesting the free cash flows in non-profitable projects (Jensen, 1986). Second, strong internal corporate governance mechanisms reduce the cost of capital for companies. The cost of capital is reduced, because strong internal corporate governance mechanisms reduce shareholders' monitoring and auditing costs. This would also lead to lower premiums being charged by suppliers of finance to the firm (Drobetz et al., 2004).

Therefore, strong internal corporate governance mechanisms are perceived as being associated with reduced cost of capital, increased shareholders protection, efficient use of organisational resources, and long term success of companies. This research is motivated by two important factors. The first factor is the inconclusiveness of the existing literature regarding the link between internal corporate governance mechanisms and the performance

of firms. The second factor is the occurrence of the financial crisis in 2007–2008. The recent financial crisis (2007–2008) provides an opportunity to investigate the two most important issues related to corporate governance. First, how are internal corporate governance mechanisms associated with the operating and financial performance of firms before and during the financial crisis? Second, how do internal corporate governance mechanisms affect the survival of firms during the financial crisis?

This provides an opportunity to test the theoretical arguments which underpin the impact of corporate governance on firm performance. First, if strong corporate governance is associated with better operating and financial performance, then firms with strong corporate governance mechanisms would outperform firms with weak corporate governance mechanisms both in normal times and during the financial crisis. Second, most corporate governance codes around the world are introduced to prevent major corporate scandals which have occurred in the past, such as Enron, Parmalat, Tyco, WorldCom, and Polly Peck. In light of this, the present study investigates whether or not corporate governance is associated with the survival of firms during the financial crisis.

1.4 Contribution of the study

This study aims to contribute to the existing debate on internal corporate governance mechanisms and the performance of firms in the following ways. First, the association between internal corporate governance mechanisms and firms' financial and operating performance will be studied by developing a non-compliance index⁷ as used by Shabbir and Padgett (2008). However, the index used in this study is more comprehensive than the one used by Shabbir and Padgett (2008). First, more internal corporate governance

⁷ The non-compliance index is a scale which measures the extent of non-compliance for a firm with the recommended provisions of the UK corporate governance code. The index is discussed in detail in Section 3.3.2.1.

provisions of the UK corporate governance code are included in the construction of the index. Second, the index is based on three different versions of the UK corporate governance code, which also happen to be the most recent versions (i.e. 2003, 2006, and 2008). Therefore, the study contributes to the methodological debate regarding the use of indices in the corporate governance literature.

Another major difference from the study carried out by Shabbir and Padgett (2008) is that the present study will take into account the recent financial crisis (2007–2008) and analyse the impact of non-compliance index on firm survival during the financial crisis. The study covers two time periods, the first of which is before the start of the financial crisis (2003–2006), whilst the second covers the financial crisis period (2007–2010). By dividing the sample period into two different time periods, analyses can be conducted in order to determine whether or not non-compliance with the UK corporate governance code affects firms' performance differently during these two different time periods. Therefore, the study provides empirical evidence related to whether or not the association between internal corporate governance and the performance of firms is affected by the sample period. To the best of my knowledge this is the only study of its kind carried out until now.

The second contribution of the study is an analysis of the impact of individual corporate governance mechanisms (such as board of directors' size, composition, independence, directors' compensation, directors' ownership, and leverage) on firm performance over a longer period (2003–2010). This period covers both normal and extraordinary times (i.e. the financial crisis). Most existing studies which analyse the impact of individual corporate governance mechanisms on firm performance usually cover only short periods of time (1 to 4 years).

The short sample periods in the existing literature have been considered as one of the reasons for the inconsistent results. Indeed, any changes in internal corporate

governance mechanisms normally affect firms in the long run, and thus studies which analyse the association between internal corporate governance mechanisms and firm performance over the short term could provide misleading results. Therefore, this study is an attempt to overcome this weakness, and as such the relationship between internal corporate governance and performance is analysed over an eight year period.

The third contribution of the study can be found in the adopted methodology. As reported in other studies (such as, Shleifer and Vishny, 1997, Denis, 2001, Schultz et al., 2010, Wintoki et al., 2012), most of the studies which investigate the relationship between corporate governance mechanisms and firm performance suffer from endogeneity. In the presence of endogeneity, results are biased and inconsistent, thus making it very unlikely that conclusions will be reliable (Roberts and Whited, 2011). Wintoki et al. (2012) argue that research on the link between internal corporate governance mechanisms and the performance of firms suffers from three forms of endogeneity.

The first type of endogeneity is known as *Dynamic endogeneity*. This type of endogeneity is present when the current corporate governance structures are determined by past firm performance. The second type of endogeneity is called *simultaneity*. This type of endogeneity is present when firm performance and corporate governance structures are co-determined, such that each variable may affect the other simultaneously. To overcome these two types of endogeneity problem, many studies have adopted a lagged performance approach (such as, Hermalin and Weisbach, 1991, Himmelberg et al., 1999, Coles et al., 2008, McKnight and Weir, 2009). However, these studies have used one or two year lags of corporate governance variables. In line with these studies this research will also adopt the lagged approach, but firm corporate governance variables will be lagged for three years so as to overcome the endogeneity problems mentioned above.

The third form of endogeneity is referred to as *unobserved heterogeneity*. With this type of endogeneity, internal corporate governance and performance relationship are affected by certain unobservable factors. To take into account this type of endogeneity, firm specific fixed effects models are recommended (e.g. Wooldridge, 2002, Gujarati, 2003). Therefore, fixed effects models are used in this study to control for endogeneity arising from unobserved heterogeneity. Furthermore, as this study covers an extraordinary time period (financial crisis 2007–2008), firm performance and internal corporate governance mechanisms are also measured in the pre-crisis period, thus reducing concerns about the endogeneity (Mitton, 2002).

The fourth contribution of the study is that it will analyse the association between internal corporate governance mechanisms and firm survival during the financial crisis (2007–2008). This will shed some light on whether or not internal corporate governance mechanisms in general and more specifically compliance with the UK corporate governance code could affect firms' survival during financial crisis.

The final contribution of the study comes from the type of sample used, which includes both financial and non-financial sectors. The large sample size increases the statistical power and validity of the results. It also provides a better opportunity to generalise the results of the study. Most of the existing literature in the UK and around the world covers only the non-financial sector, while this study will analyse the relationship between internal corporate governance and firm performance for financial and non-financial sectors at the same time in one sample. Therefore, this provides an opportunity to compare the impact of internal corporate governance mechanisms on firm performance in financial and non-financial sectors at the same time.

1.5 Structure of the thesis

The thesis is divided into five chapters and is structured as follows. Chapter 2 provides a review of the theoretical and empirical research regarding the link between internal corporate governance mechanisms and the performance of firms. As the study is based on a sample of UK listed companies, Chapter 2 will also discuss the UK corporate governance code. Finally, Chapter 2 outlines the testable research hypotheses of the study. Chapter 3 deals with discussion related to the research methodology adopted to analyse the association between internal corporate governance and the performance of firms. Chapter 3 also describes the measurement of variables, data collection methods, data sources, and econometric techniques used in the study.

The results and analysis of the study are outlined and discussed in Chapter 4, whilst the analysis of financial and non-financial firms is also discussed. Furthermore, Chapter 4 also provides results of the analysis carried out during different time periods (i.e. 2003–2006, 2007–2010, and 2003–2010). Finally, the lagged analysis, as well as the association between corporate governance and firm survival are discussed in different sections in Chapter 4. Finally, Chapter 5 discusses the conclusions of the study, whilst also discussing the limitations of the study and avenues for future research.

Chapter 2 Literature Review

2.1 Introduction

This chapter provides a review of the theoretical and empirical research regarding the link between internal corporate governance mechanisms and the performance of firms. The chapter aims to achieve two objectives. First, the various theories which inform the research in the area of corporate governance are discussed so as to understand why corporate governance could affect the performance of firms. Second, a critical review of the empirical research on the link between governance and performance is carried out to identify gaps in the existing literature and develop the testable hypotheses of the study. The remainder of this chapter is organised as follows. Section 2.2 discusses the various definitions of corporate governance. Section 2.3 reviews the theoretical research on corporate governance and performance. Section 2.4 describes the development of the UK corporate governance code. Section 2.5 reviews the empirical research on the various themes in the corporate governance research and outlines the hypotheses tested in this study, while Section 2.6 summarises the chapter.

2.2 Defining corporate governance

Corporate governance issues in modern day organisations can be traced back to as early as 1776, when Smith (1776) highlighted the potential conflicts of interest between shareholders and managers in joint stock companies. Smith (1776) argues that:

The directors of such [joint-stock] companies, however, being the managers rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves

a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company.

Adam Smith (1776, paragraph V.1.107)

Berle and Means (1932) discuss the separation of power between management⁸ and shareholders in public companies, which thrust the issue of corporate governance into the spot light. Although Berle and Means (1932) do not use the phrase corporate governance, their work lays the foundation for future work in this area. The phrase '*corporate governance*' in its current sense came into use in the 1980s (Tricker, 2012). After the seminal work of Jensen and Meckling (1976) on agency theory and the costs shareholders incur due to the separation of ownership and control, corporate governance has become one of the most debated topics amongst social science researchers. Based on its scope and different viewpoints, corporate governance is defined in a number of ways. Each of these definitions reflect alternative viewpoints of the subject (Tricker, 2012).

Tricker (2012) argues that based on different perspectives, corporate governance definitions can be classified into four categories. First, the operational perspective of corporate governance focuses on governance structures, processes, and practices. This definition of corporate governance is adopted by Cadbury (1992). Cadbury (1992, s.2.5) defines corporate governance as "the system by which companies are directed and controlled". Similarly, Gillan and Starks (1998, p.4) define corporate governance as "the system of laws, rules and factors that control operations at a company". The operational perspective has led to the introduction of best practices (related to board and shareholders)

⁸ Top management is some times referred to as directors in the UK and management in the USA.

Therefore, management and directors are used interchangeably in this thesis.

in the governance codes around the world and has been the basis for much work in corporate governance (Tricker, 2012).

The second definition of corporate governance comes from a ‘financial economics perspective’. According to this definition, corporate governance is seen as “the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment” (Shleifer and Vishny, 1997, p.737). This definition is considered as taking a ‘*narrow*’ view of corporate governance as it considers shareholders’ wealth maximisation as the most important objective of an organisation (Solomon, 2007, p.12).

The third definition of corporate governance comes from ‘a relationship perspective’, which focuses on the relationships between various participants in an organisation (such as the board, managers, shareholders and other stakeholders) (Tricker, 2012). Therefore, based on this perspective, Monks and Minow (2008, p.12) define corporate governance in the following way; “corporate governance involves the relationship among various participants, including the chief executive officer, management, shareholders, and employees, in determining the direction and performance of corporations”.

The fourth definition of corporate governance comes from the ‘stakeholder perspective’. This definition takes a broader view of corporate governance and includes all possible stakeholders of an organisation. According to this perspective, corporate governance is defined as “the system of checks and balances, both internal and external to companies, which ensures that companies discharge their accountability to all their stakeholders and act in a socially responsible way in all areas of their business activity” (Solomon, 2007, p.12).

The third and fourth definitions discussed above are closely related and both adopt a broader view of corporate governance to include other stakeholders in addition to shareholders. However, the difference between the two definitions is that the third definition is more focused on the relationships between various stakeholders within an organisation. On the other hand, the fourth definition takes a much broader view of corporate governance and focuses on external stakeholders and the social responsibility of an organisation. The fourth definition also explicitly talks about the accountability of organisations to their stakeholders.

All of the above definitions of corporate governance imply that corporate governance is a set of mechanisms directed to ensure the smooth running of organisations and to protect the interests of shareholders and other stakeholders. In general, all the definitions of corporate governance tend to share two characteristics; first corporate governance is directed to reduce agency problems and second to improve accountability to their shareholders and other stakeholders (Solomon, 2007).

The shareholders oriented corporate governance view is dominant in Anglo-Saxon countries such as the UK and USA, while the stakeholder view is adopted in continental Europe and Asia, such as in Germany and Japan (Hopt, 2011). As this study is UK based, the corporate governance definition which seems most appropriate is the second definition which focuses on shareholders' wealth maximisation.

After discussing the various definitions, discussion will now focus on the different types of corporate governance mechanisms. Corporate governance mechanisms can be internal to an organisation i.e. those mechanisms which are in place and implemented within organisations to control the day to day operations e.g. board of directors, audit committee, risk committee etc. At the same time, the corporate governance mechanisms can also be external to an organisation i.e. those mechanisms which are in place in the

external operating environment of an organisation, e.g. the market for corporate control, product market competition, capital markets etc. (Weir et al., 2002).

Corporate governance mechanisms, whether external or internal, are expected to minimise if not solve the agency problems arising from the separation of ownership and control, and thereby add to shareholders’ wealth maximisation (Jensen and Meckling, 1976). The existing literature generally classifies the internal and external corporate governance mechanisms into the following broad categories (Jensen, 1993, Shleifer and Vishny, 1997, Vives, 2000). Table 2.1 outlines the various internal and external corporate governance mechanisms as outlined in Gillan (2006, p.384):

Table 2.1 External and internal corporate governance mechanisms

External corporate governance mechanisms	Internal corporate governance mechanisms
Capital markets	Board of directors
Product market competition	Managerial incentives
Legal and regulatory mechanisms	Capital structure (debt, equity)
	Internal control systems

Capital markets exert control over firms by reflecting the level of performance and the market’s view of the management’s effectiveness through market price of the shares. According to the efficient market hypothesis, share prices indicate all firm relevant information (Fama, 1970), and thus if a firm is not performing well, then its share price will go down which could lead to a decrease in the firm’s value. This decrease in market value could make such firms targets for takeovers. As Shleifer and Vishny (1997) state that poorly performing firms are more likely to be targets of takeover bids and that managers of poorly performing targets are more likely to be replaced. Such possibilities are expected to exercise control over managerial behaviour.

Capital markets work as an indirect control mechanism, whereas legal and regulatory mechanisms work as direct control mechanisms by setting up rules and regulations which put constraints and impose requirements for adopting best practices in control and governance. Legal and regulatory mechanisms are enforced by law and carry penalties if these rules and regulations are broken (for example, corporate laws, labour laws, anti-competition laws, environmental laws, listing rules etc.).

In this regard, corporate governance regulations have been developed around the world to promote best practices in governance and protect the interests of shareholders and other stakeholders. In certain countries, such as the USA, these regulations are enforced by law. However, in other countries like the UK, compliance with corporate governance guidelines is not enforced by law and companies can either comply or explain their non-compliance. The development of these guidelines demonstrates the perceived importance of direct controls in reducing the agency problems.

The product market competition is another type of external control mechanism. In competitive markets, inefficient firms may lose market share and incur losses which may lead to serious financial distress or even bankruptcy (Denis, 2001). Capital markets and product market competition may become effective over a long period of time to discipline poorly performing management and firms, but they might not be suitable for solving complex issues arising from wasteful managerial behaviour and in situations which requires quick response (Denis, 2001). This implies that external corporate governance mechanisms might not be effective in extraordinary times such as the financial crisis. Therefore, it is important to investigate the effectiveness of internal corporate governance mechanisms in situations which require a quick response. This study aims to achieve this objective by investigating the relationship between internal corporate governance and the performance of firms during the financial crisis.

In addition to its ineffectiveness in complex situations, external corporate governance mechanisms can also be costly. Denis (2001, p. 206) argues that external corporate governance mechanisms (such as takeovers) are expensive and time consuming, and “therefore they are not likely to be effective ways of dealing with small deviations from maximum value”. Even in situations when a takeover offer is made, this can lead to additional conflicts between management and shareholders within the firm, due to the fact that management might influence the process of takeover.

The various external corporate governance mechanisms discussed above are not effective solutions to agency problems. Therefore, alternative corporate governance mechanisms are needed which can complement external corporate governance mechanisms and provide solutions for issues requiring a quick response in the short term. These alternative mechanisms can also resolve the issues arising from wasteful managerial behaviour. Therefore, it could be argued that if strong internal corporate governance mechanisms are in place within an organisation to control the agents (management), then it would complement the external controls and could minimise the need for greater external controls (such as takeovers, legal actions, product market competition etc.).

At the same time, internal corporate governance mechanisms could also work in a proactive manner rather than just as corrective tools. Indeed, internal corporate governance mechanisms would put in place measures capable of leading to improvements in performance and helping to stop agency issues arising in the first place. In fact, the argument put forward in the UK corporate governance code is that if companies comply with the recommended provisions of the code, this could lead to better corporate governance practices and increased economic efficiency (Cadbury, 1992, s 1.5).

Other reasons behind the choice to analyse only internal corporate governance mechanisms are as follows: First, external corporate governance mechanisms are beyond

the control of management, and thus it is less likely that management could influence them. Second, external corporate governance mechanisms are commonly applicable to all firms and will be the same for every firm. Finally, in order to keep the scope of the research bound and manageable, this study focuses solely on internal corporate governance mechanisms.

As it is clear from the above discussion that internal corporate governance mechanisms play a vital role in the corporate governance systems of a firm, and therefore it is extremely important for academics, regulators, management, and all other stakeholders to clearly understand the implications of internal corporate governance mechanisms for firms.

After discussing how corporate governance is defined and different types of governance mechanisms, the next section discusses the various theories which inform the research on the link between corporate governance and the performance of firms.

2.3 Theoretical background

Most of the research on corporate governance is underpinned by three predominant theories, namely agency theory, stewardship theory and resource dependence theory. These theories provide the theoretical justification for how internal corporate governance mechanisms in general and boards in particular could affect firms' performance. Nicholson and Kiel (2007) study the association of different board variables and corporate performance in the context of each of the above theories. They argue that although no single theory can fully explain the hypothesised positive link between governance and performance, but each theory could explain the association up to some extent.

Therefore, this study's hypotheses will be informed by all three of the above mentioned theories so as to thoroughly investigate the link between internal corporate

governance mechanisms and firm performance. This will make it possible to interpret the results in light of more than one theory, and will also make it possible to analyse whether each of these theories complement or contradict each other.

2.3.1 Agency theory

Agency theory postulates that there is a conflict of interest between agents and principals. The existing literature outlines three reasons for the conflict of interest based on agency theory. First, in agency theory it is assumed that the principals and agents may have different attitudes towards risk (Eisenhardt, 1989). Second, the goals of agents are different from the goals of principals (Eisenberg et al., 1998). Third, both parties to the relationship (i.e. agents and principals) are assumed to be utility maximisers to the extent that even if their goals or risk preferences were not different, the rational agent would not always act in the best interest of the principal i.e. the agents will take action which would maximise their utility even if it does not increase shareholders' wealth (Jensen and Meckling, 1976).

This conflict of interest between agents and principals leads to agency costs (Jensen and Meckling, 1976). In the context of limited liability companies, agency costs can arise from a number of sources. For example, misuse or stealing of company assets, directors paying themselves excessive incentives and other perquisites, directors choosing to devote less time, effort, personal skills, and investing company resources in loss making projects rather than paying dividends. It is reasonable to expect that the key principal i.e. shareholders, would like to minimise agency costs.

It is suggested that internal and external mechanisms of corporate governance can help to reduce agency costs (Haniffa and Hudaib, 2006). In this regard, external corporate governance mechanisms are in place in countries around the world. For instance, in the UK

a number of rules and regulations have been introduced to monitor and control directors of listed companies. These regulations include the following (Solomon, 2007, p. 50).

- fiduciary responsibility imposed on directors by company law
- legal requirement for annual audit
- the stock exchange 'model code' on directors' share dealings, companies act regulations on directors' transactions
- the City Code on Takeovers and Mergers

In addition to these rules and regulations, shareholders also have a number of other mechanisms at their disposal with which they can monitor management and align directors' interests with their own. For example, shareholders can monitor and control directors through voting at annual general meetings (AGMs), takeover bids, shareholder resolutions, selling shares, one-to-one meeting etc. (Solomon, 2007).

However, some of the above mentioned mechanisms rely on perfectly competitive and efficient markets as well as active participation by shareholders in monitoring management. Since markets are not perfectly competitive, and in the case of dispersed ownership, small shareholders will lack motivation and incentives to monitor directors (Solomon, 2007). Furthermore, legal and regulatory mechanisms might not be an effective way in which to address wasteful managerial behaviour (Jensen, 1993). Therefore, some sort of intervention in the form of internal corporate governance mechanisms is needed in order to minimise agency problems (Solomon, 2007). In order to achieve this, since the early 1990s countries around the world have been introducing codes of best practice which aim to improve corporate governance, increase accountability, and make companies more transparent. These codes of best practice generally provide guidelines for board related activities (e.g. size, composition, remuneration, nomination etc.), auditing, communication and relationship with shareholders and transparency.

These theoretical claims of agency theory have been tested empirically. On this front, research shows that better corporate governance mechanisms could help to reduce or control agency costs. For example, Core et al. (1999) show that agency costs (such as CEO compensation, management shirking etc.) are higher in firms characterised by weak corporate governance structures (such as the same person holding the posts of CEO and chairman, and a high proportion of insiders on the board).

The higher level of agency costs arising from weak corporate governance mechanisms in place within a firm has direct implications for its operating and stock market performance. Gompers et al. (2003) argue that weak corporate governance mechanisms could cause lower stock returns due to three reasons. These are: first, poor governance causes agency costs. Secondly poor governance leads to management shirking, overinvestment and other perquisites. The third reason is that investors underestimate the costs arising from agency, but as soon as they realise the magnitude of the losses they lose confidence in the firm.

The foregoing discussion highlights that weak internal corporate governance mechanisms could lead to increased agency costs. However, the question is, how could internal corporate governance mechanisms be employed to minimise agency costs and solve agency problems? In this regard, Denis (2001) describes the internal corporate governance tools which could be used to solve agency problems, namely contract, monitoring and incentives. A contract legally binds the directors for their actions. Monitors (non-executive directors) are appointed by shareholders to observe the actions of executive directors and paying higher incentives which are linked to performance align directors' interests with shareholders' interests (Jensen and Meckling, 1976, Murphy, 1985, Florackis, 2005, Ozkan, 2011).

In light of the agency theory, corporate governance mechanisms could have major implications for firms' costs and performance, in both normal and extraordinary times. Therefore, this study is an attempt to add to this debate by analysing the relationship between internal corporate governance mechanisms and firms' performance in the context of the recent financial crisis (2007–2008) for UK listed companies.

2.3.2 *Stewardship theory*

Agency theory discusses moral hazards and agency costs arising from the separation of ownership and control (Jensen and Meckling, 1976). Agency theory assumes that directors are more inclined to work for their self-interests. On the other hand, stewardship theory assumes that executives (agents) are trustworthy individuals and will work in the best interest of owners (Nicholson and Kiel, 2007). Therefore, agents will pursue organisational interests even when such interests are in conflict with the agents' self-interest (Donaldson and Davis, 1991). Furthermore, Davis et al. (1997) argue that “stewards” are executives employed by principals whose interests tend to be aligned with those of the principals, and such stewards derive higher satisfaction from behaviours which promote organisations' interests rather than from self-serving behaviour.

Stewardship theory makes certain assumptions about the directors of companies. First, it assumes that since executive directors spend their entire working lives in the same company, they know the company very well and have superior formal and informal knowledge about the firm. Therefore, they are in a good position to make better decisions for the company (Donaldson and Davis, 1991). The second assumption is that competitive internal and external market discipline, coupled with the fear of damaging their future managerial capital, ensures that agency costs are minimised (Fama, 1980, Fama and Jensen, 1983a).

Based on the above assumptions, proponents of stewardship theory argue that better firm performance is likely to be associated with internal corporate governance practices which give executive directors greater power. These practices include fewer non-executive directors (NEDs) on boards, and one person acting as CEO and chairman (Donaldson and Davis, 1991, Letza et al., 2004).

Therefore, in the context of this study, stewardship theory will provide an alternative view point to that of agency theory and will help in the interpretation of results. For example, agency theory supports more independent boards, increased monitoring, and higher remuneration packages through which to motivate and control executive directors. On the other hand, stewardship theory assumes that executive directors are sufficiently motivated to work in the best interests of their organisations. Therefore, there is no need for increased monitoring or high remuneration packages. This implies that if the assumptions of stewardship theory hold, then increasing NEDs on boards and higher remuneration could increase agency costs, thus in turn negatively affecting the performance of firms.

2.3.3 *Resource dependence theory*

Another theory which demonstrates why internal corporate governance mechanisms could affect firm performance is the resource dependence theory (Selznick, 1966, Pfeffer, 1972). This theory assumes that institutions such as boards of directors are not only necessary for monitoring, but also serve as a critical link between the firm and all the essential resources it needs for successful operations. Boards of directors link organisations to external resources and are mechanisms for managing external dependencies as well as reducing environmental uncertainties which organisations may be faced with (Pfeffer and Salancik, 1978).

Resource dependence theory assumes that directors could be an important resource for the firm in a number of ways. First, boards of directors bring experience, knowledge and independence (i.e. in the case NEDs) to the firm. Second, they can bring reputation and critical business contacts to the firm (Haniffa and Hudaib, 2006). Third, boards of directors also provide access to businesses/political elite, information and capital (Nicholson and Kiel, 2007). Finally, boards of directors link organisations to the external environment and important stakeholders such as creditors, suppliers, competitors, and customers (Nicholson and Kiel, 2007). This link to external resources could have positive effects on the performance of firms.

2.3.4 Summary

This section has provided the theoretical background for this study. In line with the existing literature in the area of corporate governance, this research is based on the assumptions of agency theory i.e. the separation of ownership and control leads to divergence of interests between directors and shareholders, which in turn leads to agency costs for firms. To align the interest of directors and shareholders, internal corporate governance mechanisms are needed. The implementation of these internal corporate governance mechanisms is expected to lower agency problems and improve firm performance. Therefore, firms with strong internal corporate governance mechanisms should demonstrate better operating and financial performance when compared with firms which have weak internal corporate governance mechanisms in place.

By contrast, stewardship theory assumes that better financial performance could be achieved by trusting the directors and giving them more powers. Finally, resource dependence theory postulates that internal corporate governance mechanisms (such as boards of directors) could positively affect the performance of firms by linking it to critical resources.

Before reviewing the existing literature regarding the link between internal corporate governance mechanisms and the performance of firms, the UK corporate governance code is discussed in the next section. The next section explains how the UK government has responded to some major corporate failures in the past by introducing corporate governance codes. The next section also explains how the UK corporate governance code aims to solve agency problems and protect the interests of shareholders and other stakeholders.

2.4 Corporate governance in the UK

2.4.1 The UK Corporate Governance Code

It is extremely common that after every corporate failure or scandal around the world (for example, Polly Peck in 1991, Enron in 2001, WorldCom in 2002), Parmalat in 2003, Lehman Brothers in 2008, Northern Rock in 2008 etc.) regulators, shareholders, and other stakeholders begin to question the corporate governance mechanisms of failed companies, and attribute such failures to the weaknesses in the corporate governance mechanisms of these firms. This often leads to the introduction of new codes of corporate governance, or revision of the existing codes. Therefore, this highlights the perceived importance of corporate governance (from the perspectives of investors and regulators) for the long-term success of companies and in protecting the interests of shareholders.

The development of corporate governance codes in the UK started after some major corporate failures in the late 1980s and early 1990s e.g. Bank of Credit and Commerce International (BCCI), Polly Peck, Maxwell Communications Corporation and Barings Bank. Since then, a series of reports which recommend best practice of corporate governance for listed companies have been introduced in the UK.

More recently, the financial crisis of 2007–2008 has led to the failure of many firms. According to a report by World Federation of Exchanges (2010), 341 firms were delisted in the UK during the period 2007–2010. This has triggered a debate regarding how companies are run and controlled in the UK. The failure of so many listed companies during the 2007–2008 financial crises has led to a revision of the existing corporate governance code and the introduction of a new code (The UK Stewardship Code).

The development of corporate governance codes in the UK started with the Cadbury report (1992). One of the major recommendations of this report is splitting the roles of chairman and chief executive officer (CEO). The objective of splitting these roles is to prevent one person from acquiring too much power and control. Therefore, it is assumed that this will lead to increased monitoring, transparency and accountability at board level, which will protect the interests of shareholders and will lead to improved performance.

The Cadbury report was followed by the Greenbury report (1995) which provides recommendations on executive pay disclosure and the setting up of audit and remuneration committees. The major recommendation of the Greenbury report (1995, p.10) is that directors' remuneration should be partly based on performance. One of the objectives of the Greenbury report is that disclosing directors' pay in detail will ensure greater transparency. Furthermore, setting up board sub committees will enhance the monitoring of executives and will increase accountability. Finally, and as proposed by agency theory, linking directors' remuneration to firm performance will lead to shareholders' wealth maximisation. Therefore, the Greenbury report assumes that if firms comply with these recommendations, then the interests of shareholders will be protected.

The Hampel report (1998) outlines the number and responsibilities of non-executive directors (NEDs) on the board of directors (BODs). The Hampel report (1998)

also combines the recommendations of the Cadbury and the Greenbury reports into one document called the combined code, which provides principles of good corporate governance for UK listed companies. The Turnbull report (1999) recommends the need for appropriate internal control systems.

The Higgs report (2003) provides recommendations on the role of non-executive directors. The Higgs report recommends that non-executive directors should represent shareholders' voices and their role should be supervisory for executive directors. The Tyson report (2003) provides recommendations for the recruitment and development of non-executive directors, whilst in the same year the Smith report (2003) also recommended the need for internal auditors and an audit committee.

The Financial Reporting Council (FRC), which is responsible for developing the corporate governance codes in the UK, compiled the recommendations of all these reports discussed above into one document in 2003 and issued a re-draft of the combined code on corporate governance or simply the "Code". This version of the combined code has been further revised in 2005 and 2007. Furthermore, in the wake of the financial crisis (2007–2008) the code has been revised again in 2009. In May 2010, the FRC issued a new version of the code. The code is now called "The UK Corporate Governance Code".

In July 2010 FRC also issued a corporate governance code called "The UK Stewardship Code" directed at institutional investors in the UK. The main purpose of this code is to provide guidance to institutional investors on engagement with investee companies. The institutional investors are required to report on the level of engagement with investee companies to their shareholders. This code is also applied on the basis of 'comply or explain'. The institutional investors are required to comply with the code or explain their non-compliance. The aim of this code is to enhance the level of engagement

between institutional investors and companies, so as to help improve the long-term returns to shareholders⁹.

Whilst reviewing the combined code in 2009, FRC (2009, p. 2) claims that “the purpose of the Code is to promote good corporate governance in the belief that this will support the long-term success of the company”. It is evident from the above discussion that the aim of the UK corporate governance code is to solve or minimise the wider agency problems which exist in modern day organisations. Minimising the agency problems will protect the interests of shareholders and should lead to improved operational and financial performance. The code outlines that these aims could be achieved by increasing transparency and disclosure, and making the executive directors more accountable by appointing NEDs and establishing internal control mechanisms. Furthermore, the code also specifies that executive directors should be rewarded for success, which will lead to greater motivation and improved performance in the future.

The UK Listing Authority requires all UK companies listed on FTSE 350 (Main Market of the London Stock Exchange) to make a disclosure statement in their annual reports and accounts as to how they have complied with the principles of the UK corporate governance code. In the case of non-compliance, they are required to explain the reasons for their non-compliance. That is why it is also referred to as the “comply or explain” corporate governance code¹⁰.

Most studies exclude financial firms as they are required to comply with additional corporate governance requirements which do not apply to non-financial firms. Since this

⁹ <http://www.frc.org.uk/FRC-Documents/FRC/The-UK-Stewardship-Code.aspx>

¹⁰ <http://www.frc.org.uk/publications/pubs.cfm?mode=list&cID=41&Start=11>

study does include financial firms, the next section sets out how corporate governance requirements are different for such financial firms.

2.4.2 Corporate governance in the financial sector

In most countries around the world, banks and other financial institutions (investment and insurance sectors) are the back bones of any economy. The financial sector is critical for the overall health of a country's economy for a number of reasons. For example, loans from banks are the main source of external finance for businesses in every other sector of an economy. Similarly, businesses and households primarily rely on banks for payments services (Mullineux, 2006). This shows that any problems in the financial sector could easily be transferred to all other sectors of the economy and could lead to major crises. In fact, the recent financial crisis (2007–2008) has emphasised why effective governance of the financial sector is important. Indeed, some analysts argue that weak corporate governance practices in financial sectors is one of the major causes of the crises (Kirkpatrick, 2009).

As discussed in the previous sections, corporate governance mechanisms (whether internal or external) are tools with which to overcome the agency problems between directors and shareholders. However, Ciancanelli and Gonzalez (2000) argue that the agency relationship in the case of financial sectors in general and banks in particular is more complex when compared with the non-financial sector. Therefore, the same set of governance mechanisms used in the non-financial sector might not be effective in overcoming the agency problems in the financial sector.

Ciancanelli and Gonzalez (2000) outline the reasons which make the agency relationship in banks more complex. In addition to the normal agency relationship between directors of banks and its shareholders, there exists a number of other agency relationships.

First, there is an agency relationship between banks' depositors, as well as between the bank and regulators. Second, there also exists an agency relationship between owners, managers and regulators. Third, there is the agency relationship which exists between borrowers, managers and regulators.

Therefore, to enhance the corporate governance of financial institutions and protect the interests of its various stakeholders, financial institutions around the world must comply with the additional regulatory requirements imposed on them. These additional regulations affect both the firms and the market in which they operate. For example, the power of markets in disciplining financial institutions is limited through regulations on entry, takeover and mergers, and administrative rules etc. (Ciancanelli and Gonzalez, 2000, Levine, 2004).

Similarly, there are regulations on the recruitment of directors in the financial sector. For example, in the UK, only those individuals who are approved by the Financial Services Authority (FSA)¹¹ can exercise control functions in the financial services industry. This regulation has direct consequences for the recruitment and movement of senior management in the financial sector, and affects the composition and size of boards of directors in the financial sector.

Corporate governance needs of the financial sector are different from those of the non-financial sector as regulation directly affects some of the governance mechanisms in terms of board size, board composition etc. Adams and Mehran (2003) provide empirical evidence that there is a significant difference between corporate governance of banking firms and manufacturing firms in terms of board size, board make-up, compensation structure, and ownership structure.

¹¹ FSA is a regulatory authority responsible for the regulation of the financial services industry in the UK.

In addition to regulations, another factor which could affect the corporate governance mechanisms of financial institutions is the high level of leverage. Some research shows that the level of debt could also work as an internal corporate governance mechanism (Jensen, 1993). Existing research highlights the implications of a high level of leverage for other internal corporate governance mechanisms, such as board composition, board size and compensation etc. To this end, John and John (1993) argue that due to the high level of leverage, managerial compensation in the banking industry should have low pay-performance sensitivity (i.e. the proportionate increase in directors' pay with the increase in company's performance). John and John (1993) explain that high pay-performance sensitivity encourages managers to take more risks. However, the high level of leverage means firm has to service its debts, which makes such an organisation more volatile to a sharp decrease in its profits. To keep the firm more stable and decrease its riskiness due to the high level of leverage, the pay-performance sensitivity in banks should be low.

To test this theoretical assumption, John and Qian (2003) study 120 banks for the period 1992 to 2002 in the USA and analyse the pay-performance sensitivity of managerial compensation. They show that directors' pay increases by \$4.7 per \$1000 increase in shareholders' wealth, while in the manufacturing sector directors' pay increases by \$6 per \$1000 increase in shareholders' wealth. This shows that pay-performance sensitivity in the banking industry is indeed lower than pay-performance sensitivity in manufacturing. This also indicates that due to the differences in regulatory requirements and business structures in financial and non-financial sectors, the same set of internal corporate governance mechanisms could have different implications for firms in financial and non-financial sectors.

Taking into account the fact that, firms in the financial sector also have to comply with some additional regulatory requirements. The relationship between internal corporate governance mechanisms and firm performance for financial and non-financial sectors is analysed separately. However, it is not the objective of the study to analyse the impact of these extra regulatory requirements on performance in the financial sector. The reason for including the financial sector in the study is to analyse what effect, if any, these extra regulatory requirements have on the relationships between the level of compliance with the UK corporate governance and firm performance.

The UK corporate governance code does not make any distinction between financial and non-financial sectors, and the same set of principles apply to all listed companies in the UK. Firms in the financial sector are required to report their compliance with the UK corporate governance on the basis of 'comply or explain' in the same way as non-financial firms. However, as mentioned earlier, firms in the financial sector have to follow additional set of rules and regulations of the Financial Services and Markets Act 2000 (FSMA)¹².

Therefore, the same set of internal corporate governance mechanisms is used to study the relationship between corporate governance and performance for both financial and non-financial sectors. This provides an opportunity to investigate whether or not the same set of internal corporate governance mechanisms affects the performance of firms differently in financial and non-financial sectors. The study also analyses financial and non-financial firms over the same time period, using the same set of governance mechanisms.

¹² All of these rules and guidance are available at: <http://fsahandbook.info/FSA/html/handbook/>

After discussing the UK corporate governance code, the next section reviews the theoretical and empirical literature on the link between internal corporate governance and the performance of firms. The section also outlines the testable hypothesis of the study.

2.5 Themes of research on internal corporate governance and firm performance

As discussed earlier, internal corporate governance mechanisms are critical when it comes to alleviating the problems which arise from the separation of ownership and control. Therefore, internal corporate governance mechanisms and their impact on the operating and financial performance of firms has been the focus of many research studies over the last four decades. These studies have looked into various aspects of the internal corporate governance mechanisms of firms. The components of internal corporate governance mechanisms which are considered to be the most important for the performance of firms are board of directors, board committees, board of directors' remuneration and leverage. For instance, Jensen (1993) and Bozec (2005) argue that there are three components which make up the internal corporate governance of a firm, namely (1) Board of directors (2) Board committees (e.g. Audit, compensation, Nomination etc. and (3) Compensation plan. Literature on each of these components will be reviewed in the following sections.

2.5.1 Board of directors (BODs)

The Board of directors (BODs) is considered as one of the most important internal corporate governance mechanisms which helps to minimise the agency problems and align the interests of shareholders and directors (Jensen, 1993, Bozec, 2005). Therefore, its role in the internal corporate governance of a firm, as well as its impact on firms' operating and

financial performance has been the focus of many studies in the field of finance, management, accounting, and economics over the last four decades.

The board of directors serves as a vital link between the shareholders and managers of an organisation. Board of directors can play a major role in controlling the day to day activities of a firm by monitoring the management, and at the same time BODs are also involved in setting up the long term strategic direction of an organisation. Highlighting the importance of BODs, Perry and Shivdasani (2005) state that “charged with hiring, evaluating, compensating and on-going monitoring of the management, the BODs is one of the most important mechanisms for the oversight of managers”.

Similarly, Goodstein et al. (1994) classify the role of BODs into three broad categories based on three theories of management and finance¹³. According to Goodstein et al. (1994) these roles for BODs are as follows. First, BODs link a firm to external resources, which supports the resource dependence theory (Selznick, 1966, Pfeffer, 1972, Burt, 1983). Second, there is the monitoring role, the purpose of which is to monitor management of the company on behalf of shareholders as suggested by agency theory (Jensen and Meckling, 1976). Finally, there is the BODs’ role in looking after the company’s resources and providing strategic direction to the organisation; a notion which stems from stewardship theory (Donaldson, 1990, Donaldson and Davis, 1991).

Various aspects of BODs are considered to be important for the performance of firms in the existing literature regarding the link between BODs and firm performance. These components of BODs are its size, composition, committees, compensation, and

¹³ These theories are, (1) Agency theory (2) Resource dependence theory (3) Stewardship theory. Each of these theories and its link with corporate governance and firm performance was discussed in detail in Section 2.2.

ownership. In the following section, the existing literature on each of these aspects is reviewed.

2.5.1.1 BODs size

i) The theoretical link between board size and firm performance

The link between board size and firm performance comes from organisational theory. Organisational theory postulates that as groups increase in size they become less effective, as it becomes more difficult to coordinate them (Steiner, 1972, Pfeffer, 1973, Hackman, 1990). Drawing their inspiration from organisational theory, the proponents of smaller corporate boards argue that small boards are more effective than large boards (Lipton and Lorsch, 1992, Jensen, 1993, Yermack, 1996). Based on agency theory, there are several reasons why small boards could be more effective than larger boards. First, it is argued that when a board gets too big it becomes difficult to co-ordinate and becomes dysfunctional, therefore leading to more agency costs (Jensen, 1993, Huang et al., 2009). Similarly, Yawson (2006) argues that the intensity of agency problems is greater in larger boards when compared with smaller boards. Second, increasing the number of people on board costs money for the firm, therefore increasing the board size will lead to higher costs in the form of compensation.

Finally, it is argued that smaller boards are more likely to work as a team and will have more effective discussions. This ultimately leads to better decision making, which is in the long term interests of shareholders (Lipton and Lorsch, 1992).

A contrary theoretical view on the relationship between board size and firm performance is that large boards are more effective than smaller boards (John and Senbet, 1998, Yawson, 2006). This view is informed both by agency theory and resource dependence theory. Based on resource dependence theory, firms with large corporate

boards will have greater diversity, skills, experience, and business contacts. Such firms will be better equipped to perform well in competitive environments and will have greater opportunity to acquire critical resources (Haniffa and Hudaib, 2006, Yawson, 2006).

Second, based on agency theory, larger boards with a higher number of independent directors on board will be better equipped to carry out the monitoring of management. Larger boards with varied expertise and experience will be better placed to question and scrutinise management (Kiel and Nicholson, 2003). Furthermore, it is also argued that larger boards have positive implications for monitoring activity within firms (John and Senbet, 1998).

ii) The empirical evidence on board size and firm performance

The empirical evidence on the link between board size and firm performance provides mixed results. Yermack (1996) studies the association between board size and firm value (measured by Tobin's Q). Yermack (1996) argues that there is a negative relationship between BODs size and firm value. Other studies that have reported a negative relationship between board size and firm value include Jensen (1993), Eisenberg et al. (1998), Cheng (2008), and Lau et al. (2009). However, studies carried out in various countries around the world have produced mixed results (e.g. Fosberg, 1989, van et al., 2003).

Various authors have provided different reasons for the negative association between large board size and firm performance. For example, Jensen (1993) argues that when board size increases, it becomes more difficult for BODs to control managers. This lack of control leads to additional agency problems and negatively affects firms' performance. More recently, Huang et al. (2009) study 1,500 USA firms listed on the Standard and Poor (S & P) index during the period 1996 –2002. They show that large

board size is positively associated with higher agency costs. Therefore, these higher agency costs lead to a decrease in firm value. Similarly, in the UK context, Ozkan (2011) shows that board size is positively associated with CEO compensation. Ozkan (2011) argues that the lack of coordination and decision-making in large boards could make such boards ineffective, which could be revealed in the form of excessive CEO compensation.

Furthermore, Lipton and Lorsch (1992) argue that when board size is large, directors do not challenge top management and are less likely to take part in discussions during strategy formulation, because the personal cost to directors falls in large boards, they call this as ‘free riding’ problem. Here, Lipton and Lorsch (1992) point out that as the number of people on boards increases, the individual responsibility and blame on each director decreases. Therefore, in the case of poor performance, it is difficult to establish who is responsible, but if the firm is performing well everyone gets the credit. On the other hand, in small boards, each individual director could be held responsible for his/her actions as the group is small and it is more difficult to transfer the blame on to the group as a whole. Therefore, this could lead to a negative association between board size and firm performance.

Furthermore, larger boards could also affect the communication and decision making process of the board. Sah and Stiglitz (1986, 1991) argue that due to diversity of opinions, costly communications and differences in individuals’ ability to process information in large boards, the final decision of the BODs is most likely to be a compromise. Sah and Stiglitz (1986, 1991) further argue that the compromises made during decision making could increase the likelihood that BODs might reject a risky but profitable project.

In the UK context, Dahya et al. (2002) analyse a sample of 460 listed firms for the period 1988 to 1996. Dahya et al. (2002) report that there is a negative relationship

between board size and the performance related turnover of top management. This finding indicates that large boards are less effective when it comes to disciplining and monitoring top management. This ineffectiveness will lead to increased costs and will negatively affect firm performance. Similarly, using a sample of 2,746 UK listed firms for the period 1981-2002, Guest (2008) reports a negative relationship between board size and the performance of firms measured by Return on Assets (ROA), Tobin's Q and share returns. The findings of these studies offer support to the theory that smaller boards are more effective in monitoring and disciplining top management, and also more effective in decision making.

On the other hand, certain studies demonstrate a positive relationship between board size and firm performance (e.g. Chaganti et al., 1985, Van den Berghe and Levrau, 2004, Coles et al., 2008, Belkhir, 2009, Aebi et al., 2012, Mangena et al., 2012). Coles et al. (2008) study the relationship between board structure and firm value as measured by Tobin's Q for a sample of US firms for the period 1992–2001. Coles et al. (2008) find that board size is positively associated with Tobin's Q in large and complex organisations. Complex and large organisations will require greater monitoring and will need access to more resources. Therefore, based on agency theory (monitoring) and resource dependence theory (access to resources), large and complex firms may benefit from having an increased number of people on their boards.

Furthermore, Chaganti et al. (1985) argue that, as large boards could have more professional experts from various backgrounds, they will be able to provide versatile and more expert opinions when it comes to strategic decision making. Therefore, large boards are less likely to experience failures. Some studies have also analysed the association between board size and the performance of firms in the banking industry (Adams and Mehran, 2005, Andres and Vallelado, 2008, Belkhir, 2009, Aebi et al., 2012). These

studies show that the inclusion of more directors on a board leads to better firm performance. Therefore, these studies offer support to the view that larger boards could be more beneficial in complex and large firms.

Mangena et al. (2012) study a sample of 53 Zimbabwean listed firms for the period 2000 to 2005. They divide the sample into two periods, one before the presidential elections (which they categorise as an economically and politically stable period), and second after the presidential elections (which they categorise as an economically and politically hostile period). Mangena et al. (2012) show that board size is positively associated with firm performance in the post presidential elections period only. Their findings offer support to the resource dependence view that larger boards will link the firm to critical resources, which will have a positive impact on firm performance during difficult economic time periods.

Some researchers also argue that board structure variables (such as board size and composition) are endogenously chosen by firms. Therefore, a certain board size, and composition which suits one organisation's needs and requirements will not be suitable for another one even in the same industry. Hence, the proponents of this view argue that one should not observe any association between board structures and firm performance, because each board structure will be optimally chosen by firms (e.g. Gillan et al., 2004, Raheja, 2005, Bhagat and Bolton, 2008, Harris and Raviv, 2008, Daines et al., 2010, Pathan and Skully, 2010).

Research has also been carried out on the association between board size and firm survival in extraordinary times (such as the financial crisis). For instance, Graham and Narasimhan (2004) study 446 industrial firms listed on the New York Stock Exchange (NYSE) during the Great Depression period of 1928–1938. They show that firms with smaller boards have a lower probability of becoming financially distressed.

iii) Recommendations of the UK corporate governance code on board size and hypotheses development

As far as the board size is concerned, Section 154 of the UK Companies Act 2006 requires that every public company must have at least two directors. However, there is no provision related to the minimum or maximum number of directors on board in the UK corporate governance code. With this said, principle A.1 of the UK corporate governance code does state that “every company should be headed by an effective board which is collectively responsible for the long-term success of the company”¹⁴.

The foregoing review shows that board size has been the focus of many studies. Some studies show that board size is positively associated with firm performance, whilst others show a negative relationship between board size and organisational performance. Moreover, some studies show that board size is not associated with the performance of firms at all. This shows that the existing literature on boardsize and performance is inconclusive and needs further investigation.

Furthermore, no study has yet analysed the relationship between board size and firm performance for the same sample of companies in two economically different time periods (i.e. before the financial crisis and during the financial crisis). This study will provide evidence on how board size is associated with firm performance in these two different time periods. In addition, the study will also analyse and compare the relationship between board size and performance for financial and non-financial firms. Finally, the study seeks to provide empirical evidence on the link between board size and firm survival in the context of the financial crisis (2007–2008). This study is the first of its kind in the UK context.

¹⁴<http://www.frc.org.uk/getattachment/b0832de2-5c94-48c0-b771-ebb249fe1fec/The-UK-Corporate-Governance-Code.aspx>

The view that large boards could lead to more agency costs and dysfunctional boards is adopted in this study, as most of the existing literature supports this view. The increased agency costs which arise due to large boards could negatively affect firms' operating and financial performance in the times leading to the financial crisis. Hence, firms with larger boards would be vulnerable in extraordinary times (such as the financial crisis) and their probability of failure increases. Therefore, the null hypothesis related to the relationship between board size and firm performance is stated as:

H0: There is no relationship between board size and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H1a: There is a negative relationship between board size and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between board size and firm survival during the financial crisis (2007–2008) is stated below:

H0a: There is no relationship between board size and firm survival during the financial crisis.

H1b: There is a negative relationship between board size and firm survival during the financial crisis.

2.5.1.2 BODs composition

i) The theoretical link between board composition and firm performance

The composition of a BODs in terms of the presence of non-executive directors (NEDs) on board is considered to be one of the most important internal corporate

governance mechanisms when it comes to helping to reduce agency problems. BODs composition in the context of this study is defined as the ratio of non-executive directors on board to total directors on board. Theoretically, there are three views regarding the relationship between NEDs on board and the performance of firms.

The first view is that the presence of NEDs on BODs can reduce agency problems, therefore leading to improved firm performance (Fama, 1980, Lipton and Lorsch, 1992). The proponents of agency theory argue that there is a divergence of interests between shareholders and internal directors (i.e. executive directors). Furthermore, it is assumed that executive directors are less transparent and accountable. On the other hand, NEDs bring independent judgment to the board (Cadbury, 1992, Chhaochharia and Grinstein, 2007). Therefore, NEDs are needed to monitor these executive directors on behalf of shareholders (Fama, 1980, Sonnenfeld, 2002).

Furthermore, from the resource dependence theory perspective, NEDs bring critical resources to the firm in the form of professional expertise, experience, and business contacts. These resources could play a crucial part in the success of a firm (Haniffa and Hudaib, 2006).

Another theory which supports a positive relationship between NEDs and the performance of firms is information asymmetry and signalling theory. The proponents of this theory argue that the appointment of NEDs helps in reducing the information asymmetry between the stakeholders of a firm and its management (Black et al., 2006). The appointment of NEDs signals to the outsiders that they will be treated fairly and their investments are safe (Black et al., 2006). It also signals to the outsiders that the BODs have skilled, and experienced experts from various backgrounds who are capable of making strategic decisions on their behalf (Fama and Jensen, 1983b). Therefore, a higher proportion of NEDs on BODs is expected to improve financial performance.

The second view, which is based on stewardship theory, predicts a negative relationship between the number of NEDs and firm performance (Baysinger and Hoskisson, 1990, Agrawal and Knoeber, 1996, Vafeas and Theodorou, 1998, Weir and Laing, 2000). The justification for the negative relationship between NEDs and performance is that NEDs might not have adequate knowledge and information regarding the complexities of the firm, and therefore will not be able to scrutinise and challenge the executive management (Weir and Laing, 2000). Similarly, management hegemony theory (where NEDs are dependent on top executive management) also predicts that increasing the number of NEDs on board will lead to more costs and will negatively affect the performance of firms (Choi and Hasan, 2005).

The third view regarding the impact of NEDs on firm performance is that it should not affect firm performance in any way. As discussed earlier, this view is informed by the argument that board structures are endogenously chosen, and therefore each firm will choose an optimal board structure. If every board structure is optimally chosen, then one should not observe any relationship between board variables and firm performance (e.g. Gillan et al., 2004, Raheja, 2005, Bhagat and Bolton, 2008, Harris and Raviv, 2008, Daines et al., 2010, Pathan and Skully, 2010).

ii) The empirical evidence on board composition and firm performance

Many studies have empirically tested the above assumptions. Weir et al. (2002) study 311 UK listed firms for the period 1994 to 1996 and report a positive relationship between NEDs and the performance of firms measured by Tobin's Q. More recently, studying a sample of 180 Indian listed firms for the period 2005 to 2006, Jackling and Juhl

(2009) show that the percentage of NEDs on board is positively associated with firm performance (measured by ROA and Tobin's Q).

Some studies have also analysed the stock market reaction to the announcement of NEDs by using event study methodology. The results of these studies show that the appointment of NEDs is positively associated with firm value (e.g. Rosenstein and Wyatt, 1990, 1997, Shivdasani and Yermack, 1999). This shows that investors see the appointment of non-executive directors as a positive development and are willing to pay a premium for the shares of such companies.

Furthermore, some studies also show that a higher number of non-executive directors on boards improves operating efficiency, which in turn leads to higher profitability (e.g. Baysinger and Butler, 1985, Byrd and Hickman, 1992, Brickley et al., 1994). The increase in operating efficiency can be attributed to two factors. First, the improved monitoring by NEDs will lead to better use of organisational resources (Fama, 1980, Lipton and Lorsch, 1992, Chhaochharia and Grinstein, 2007). Second, the skills, expertise, and experience brought to the board room by NEDs will ensure a more effective strategic decision making process (Johnson et al., 1993). Moreover, the NEDs will link the organisation to critical resources which might be crucial for its profitability (Haniffa and Hudaib, 2006).

In contrast with the above evidence, a number of studies show a negative association between NEDs and the performance of firms. (e.g. Agrawal and Knoeber, 1996, Coles et al., 2008, McKnight and Weir, 2009, Pathan, 2009, Erkens et al., 2012, Aebi et al., 2012, Beltratti and Stulz, 2012, Adams, 2012, Mangena et al., 2012). For example, in the UK context, Guest (2008) studies 2756 firms over the period 1981 to 2002 and reports that a larger number of NEDs on board is negatively associated with the performance of firms measured by return on assets (ROA).

Choi and Hasan (2005) argue that the reason for the negative relationship between non-executive directors on board and firm performance can be justified based on managerial hegemony theory i.e. where the non-executive directors are dependent on top management. Furthermore, non-executive directors might not have adequate knowledge and information about the firm in which they are employed (Vafeas and Theodorou, 1998, Adams, 2012). Hence, increasing the number of NEDs might not lead to value maximisation, but instead could negatively affect firms' performance by increasing costs.

Similarly, using 18,839 firm-year observations of financial and non-financial firms, Adams (2012) reports that banks receiving bailout funds during the 2007–2008 financial crisis had more independent boards. Adams (2012) argues that the NEDs have less knowledge of the inner workings of the company. Therefore, NEDs might not be able to provide strategic advice and monitor executive management when it is needed the most.

On the other hand, some studies show no relationship between NEDs and firm performance (e.g. Bhagat and Black, 2002, Belkhir, 2009). Bhagat and Black (2002) study the impact of the presence of non-executive directors on board on firms' performance (measured by Tobin's Q, return on assets, sales to assets) for a sample of 934 US firms. Bhagat and Black (2002) report that, although poor performing firms increase the number of non-executive directors on boards, but the increase in the number of non-executive directors on boards does not improve performance. Other studies which show no relationship between non-executive directors on boards and firm performance include (e.g. Baysinger and Hoskisson, 1990, Hermalin and Weisbach, 1991, Nicholson and Kiel, 2007).

Quite a few studies have analysed the association between the number of non-executive directors on board and firms' survival or failure during difficult times (such as an industrial decline, financial crisis, or any other internal or external shock to the company).

For example, Byrd et al. (2001) study 86 investment banks operating in the period 1980–1994 in the USA. They study the association between the number of non-executive directors on board (amongst other corporate governance variables) and firms' survival/failure during the turbulent economic period. Their major finding is that the probability of failure for investment banks decreases as the number of independent non-executive directors on board increases. This highlights that the number of non-executive directors on board could have major implications for firms during difficult times.

Similarly Filatotchev and Toms (2003) study 45 UK firms in the textile industry for the period 1950–1965, when the industry was in decline. They find that surviving companies had more non-executive directors on boards. In contrast, most recently, Erkens et al. (2012) study 306 financial firms from 31 countries for the period 2007–2008. Erkens et al. (2012) argue that increasing the number of NEDs on board could lead to heavy losses and more risks being taken in the period prior to the crisis which could then subsequently negatively affect firms when a crisis period materialises.

iii) Recommendations of the UK corporate governance code on board composition and hypotheses development

Provision B.1.2 of The UK corporate governance code requires that except for smaller companies (i.e. companies listed below FTSE 350) at least half of the board, excluding chairman, should comprise independent non-executive directors. Therefore, this shows that the UK corporate governance code also advocates that having NEDs on board will have positive effects on the performance of firms. Therefore, it encourages the appointment of NEDs on boards of listed companies.

However, the above review shows that the theoretical as well as the empirical evidence on the link between NEDs and firm performance is mixed, and thus requires

further investigation. This study could contribute to the debate in two ways. First, it will analyse the impact which composition of the board of directors and other governance variables have on firms' financial and operating performance in the pre-crisis period (2003–2006) and crisis period (2007–2010). Second, the study will look into the association between board independence and firms' survival during the crisis. The UK provides a very good environment for such an experiment, because the UK corporate governance code is not enforced by law, and thus the board structures of UK listed companies may be different in terms of the number of non-executive directors on board.

The testable hypotheses regarding the relationship between NEDs and firm performance are stated below:

H0: There is no relationship between the ratio of non-executive directors on board and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H2a: There is a positive relationship between the ratio of non-executive directors on board and firm (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between NEDs and firm survival during the financial crisis (2007–2008) is also stated below:

H0: There is no relationship between the ratio of non-executive directors and firm survival during the financial crisis.

H2b: There is a positive relationship between the ratio of non-executive directors and firm survival during the financial crisis.



2.5.1.3 BODs compensation

i) The theoretical link between compensation and firm performance

The theoretical link between compensation and organisational performance comes from two theories i.e. agency theory and stewardship theory. Agency theory predicts a positive link between pay and performance, and assumes that both parties in the agency relationship (i.e. agents and principals) are utility maximisers. Therefore, one way of solving the conflict of interests between shareholders and directors is to give directors higher compensation. Furthermore, the compensation should be linked to the performance of firms. This will increase directors' motivation and they will be more inclined to work in the best interest of shareholders (Jensen and Meckling, 1976). Linking directors' compensation to company performance can also help in reducing the agency problems. Directors will try to increase their own wealth, although in order to achieve this, they will first have to improve their organisational performance. Therefore, this will lead to improved firm performance (Jensen and Meckling, 1976).

A contrasting view to agency theory is stewardship theory. Stewardship theory assumes that executives (agents) are trustworthy and motivated individuals (Nicholson and Kiel, 2007) and they will work in the best interests of owners. The implication of this is that agents will pursue organisational interests even when such interests are in conflict with the agents' self-interests (Donaldson and Davis, 1991). Therefore, based on this assumption of stewardship theory, paying a higher level of compensation to directors will lead to increased operational costs for organisations with little or no effect on improving its performance. If the assumption of stewardship theory holds, then one would expect a negative relationship between pay and performance.

ii) The empirical evidence on compensation and firm performance

Many studies have empirically tested the above theoretical assumptions and analysed the impact of higher compensation on firm performance. In line with the predictions of agency theory, most of these studies support the view that it has a positive impact on firms' performance (see for example, Murphy, 1985, Coughlan and Schmidt, 1985, Benston, 1985, Benito and Conyon, 1999, Florackis, 2005, Bayless, 2009, Chen et al., 2011, Ozkan, 2011).

Ozkan (2011) analyses the relationship between CEO compensation and firm performance (measured by stock returns and Tobin's Q) for a sample of 390 UK non-financial listed firms for the period 1999–2005. Ozkan (2011) includes both cash and equity based compensation in the CEO pay. Ozkan (2011) reports that a 0.75% increase in CEO compensation leads to a 10% increase in shareholders' wealth.

However, many studies show a negative relationship between BODs compensation and firm performance. For example, Denis et al. (2006) argue that higher remuneration could be the result of weak internal corporate governance mechanisms within a firm and it affects firm performance negatively. Similarly, Adams (2012) studies the pay structures of financial and non-financial firms for the period 1996–2007. Adams (2012) reports that poorly governed firms may be more likely to overpay their directors. The results of both these studies imply that if directors' compensation is driven by lack of good corporate governance, then higher compensation is part of agency costs rather than a mechanism with which to minimise agency costs (Bebchuk and Fried, 2003). Therefore, a negative relationship between directors' compensation and the performance of firms could be expected.

Furthermore, linking directors' compensation to firm performance can also lead to short termism. Directors will take up investment projects which could lead to better firm performance in the short run, so that they can receive higher compensation. However, such investment projects might not be in the best interest of the firm in the long run. Some studies have also shown that linking directors' compensation to firm performance could induce directors to misreport financial information. For example, Bergstresser and Philippon (2006) report that companies with more incentivised CEOs – i.e. those CEOs whose overall compensation is more sensitive to company share price– have higher levels of earnings management (i.e. where directors manipulate financial statements to report higher profits). Similarly, Denis et al. (2006) also show that there is a positive relationship between executive stock option compensation and the likelihood of securities fraud.

Furthermore, in the UK context, Florackis (2008) studies the relationship between board compensation and agency costs for a sample of 897 listed firms over the period 1999–2003. Florackis (2008) measures agency costs using two proxies, namely the ratio of selling, general and administrative expenses to sales, and the asset turnover ratio. Florackis (2008) reports a significantly positive relationship between board compensation and agency costs. This provides support for the argument that executive compensation leads to more agency problems rather than minimising them (Bebchuk and Fried, 2003).

In the context of the recent financial crisis, Fahlenbrach and Stulz (2011) analyse the relationship between CEO pay and firm performance for a sample of 95 US banks listed on the Standard and Poor (S & P) index for the period 2006–2008. Fahlenbrach and Stulz (2011) report that banks in which CEO pay is better aligned with the interests of shareholders (i.e. higher proportion of CEO pay is linked with company's performance) perform worse during the financial crisis (2007–2008). This finding again indicates that higher pay could lead to worse performance rather than better performance.

In order to get the perspective of directors on the link between pay and performance, Bender (2004) conducts 35 interviews¹⁵ in 12 UK listed companies. The major finding of Bender's (2004) study is that performance related pay is used for strategic and human resource purposes (i.e. retention and attraction), and to conform to the current market practices rather than to motivate directors to improve performance. Bender (2004) further shows that pay for performance has no positive effect on firm performance.

iii) Recommendations of the UK corporate governance code on compensation and hypotheses development

The main principle (D.1) related to directors' remuneration in the UK corporate governance code states that:

Levels of remuneration should be sufficient to attract, retain and motivate directors of the quality required to run the company successfully, but a company should avoid paying more than is necessary for this purpose. A significant proportion of executive directors' remuneration should be structured so as to link rewards to corporate and individual performance.

This shows that the UK corporate governance code also supports the agency theory perspective that increasing directors' compensation should lead to a better alignment of directors' and shareholders' interests.

Therefore, the testable hypothesis related to the relationship between total board compensation and firm performance is stated below:

¹⁵ with remuneration committee chairmen, NEDs, company secretaries, company chairmen, pay consultants, and CEOs

H0: There is no relationship between the overall level of compensation and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H3a: There is a positive relationship between the overall level of compensation and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between board compensation and firm survival during the financial crisis (2007–2008) is stated below:

H0: There is no relationship between the overall level of compensation and firm survival during the financial crisis.

H3b: There is a positive relationship between the overall level of compensation and firm survival during the financial crisis.

2.5.1.4 BODs share ownership

i) The theoretical link between BODs share ownership and firm performance

Agency theory suggests that increasing directors' share ownership helps to reduce agency problems. The proponents of this view argue that as directors' share ownerships increase, it becomes more beneficial for them to improve organisational performance. Furthermore, being shareholders of the company, directors will incur personal losses if their organisation is not profitable (Jensen and Meckling, 1976, Fama, 1980). Therefore, increased directors' share ownership provides extra incentives for directors to reduce agency costs and maximise shareholders' wealth.

However, a contrary theoretical perspective, i.e. *entrenchment hypothesis*, suggests that at high levels of share ownership, directors become more powerful and it becomes difficult for shareholders to control and discipline them. Therefore, without the fear of being removed from their positions, such directors might pursue strategies which could lead to a decrease in shareholders' wealth (Morck et al., 1988, McConnell and Servaes, 1995, Short and Keasey, 1999). In such a situation, the relationship between director share ownership and performance will be negative.

Similarly, another reason for the negative relationship between directors' share ownership and firm performance is that it affects the risk taking behaviour of directors (Kim and Lu, 2011). At high levels of share ownership, directors might become risk averse as they will have to share losses with other shareholders (Gulamhussen et al., 2012). Therefore, they could forego a riskier but profit generating project. This risk averse behaviour of directors could have negative implications for the performance of firms.

ii) The empirical evidence on BODs share ownership and firm performance

The empirical results of studies which analyse the impact of directors' share ownership on firm performance are mixed. As proposed by agency theory, some studies report a positive relationship between directors' share ownership and firm performance. For instance, studying a sample of 962 non-financial listed firms for the period 1999–2003, Florackis (2005) argues that directors' share ownership has a significant positive effect on firms' performance in the UK. In another related study Florackis and Ozkan (2008) study 897 UK listed non-financial firms for the period 1999–2003. A major finding of their study is that directors' share ownership is strongly associated with reducing agency costs. Therefore, this reduction in agency costs leads to improved firm performance.

More recently, Gulamhussen (2012) studies a sample of 123 listed banks in 23 countries around the world for the period 2007–2010. Gulamhussen (2012) reports that directors' share ownership is strongly positively associated with firm performance measured by Tobin's Q, ROA and ROE.

Closely related to this study, Mangena et al. (2012) investigate the effect of directors' share ownership on the performance of Zimbabwean firms in two time periods i.e. in the pre presidential period (which they call the stable period) and post presidential period (a politically and economically hostile period). Mangena et al. (2012) report that managerial share ownership is positively associated with firm performance in the post presidential period and negatively associated with performance in the pre presidential period.

On the other hand some empirical studies show a negative relationship between directors' share ownership and firm performance. For instance, using a sample of 371 fortune 500 US firms in 1980, Morck et al. (1988) investigate the relationship between directors' share ownership and firm value measured by Tobin's Q. Morck et al. (1988) show a significantly negative relationship between directors' shareholding and firm value, when directors' shareholding increases above 5% of the total shares of a company and up to 25%. However, they show a significantly positive relationship between directors' shareholding and performance at a share ownership levels of 0% to 5%. This finding suggests that higher level of directors' shareholding indeed leads to managerial entrenchment, which negatively affects the performance of firms.

Other studies which have also reported a negative relationship between directors' share ownership and firm performance include Hermalin and Weisbach (1991), McConnell and Servaes (1995), Short and Keasey (1999), Weir and Laing (2000), and Davies et al. (2005). These studies outline the following reasons for the negative relationship between

managerial ownership and firm value at higher levels of directors' share ownership. First, managers of firms with high levels of share ownership are more powerful and as such it is difficult for shareholders to control them. Second, the managers of such firms have enough control to enforce their views. Finally, such managers find it more beneficial to consume perquisites (such as, expensive offices, private jets and attractive salaries) rather than maximise firm value.

In the UK context, Short and Keasey (1999) study the relationship between directors' share ownership and performance measured by return on shareholders' equity. Short and Keasey (1999) provide evidence in support of the entrenchment effect, and show that higher levels of directors' share ownership is negatively associated with firm performance. Similarly, Kim and Lu (2011) also find a negative relationship between CEO ownership and firm performance for a sample of US firms.

Another strand of studies show that there is no relationship between directors' share ownership and firm performance (e.g. Demsetz and Lehn, 1985, Himmelberg et al., 1999, Simpson and Gleason, 1999, McKnight and Weir, 2009).

iii) Hypotheses development

From the agency perspective, it is expected that share ownership is positively associated with the performance of firms in the pre-2007 and post-2007 periods. However, adopting the view that higher levels of share ownership induce managers to take more risks, then firms with high level of directors' share ownership will be more riskier than others and could face more difficulties in the case of exogenous shocks (such as a financial crisis). Therefore, we expect a negative relationship between share ownership and the survival of firms during the financial crisis (2007–2008).

The testable hypotheses are given below:

H0: There is no relationship between directors' share ownership and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H4a: There is a positive relationship between directors' share ownership and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between directors' share ownership and firm survival during the financial crisis (2007–2008) is stated below:

H0: There is no relationship between directors' share ownership and firm survival during the financial crisis.

H4b: There is a negative relationship between directors' share ownership and firm survival during the financial crisis.

Board committees and other internal control mechanisms

i) The theoretical link between board committees, internal control mechanisms and firm performance

The impact of the presence of board committees on the performance of firms has been the focus of many research studies. Boards need committees to carry out their activities efficiently and effectively (Jiraporn et al., 2009). Board committees can be broadly divided into two categories based on their functions (Harrison, 1987). First, there are monitoring committees, e.g. nomination committee, remuneration committee and audit committee. The purpose of these committees is to monitor executive management and

protect the interests of shareholders. The second type of board committees is the operating committees, e.g. executive committee, investment committee, finance committee, risk committee, etc. The purpose of these committees is to advise management and the board on major corporate decisions.

There are two theoretical propositions regarding the relationship between board committees and firm performance. Based on agency theory, one argument is that increasing the number of board committees will lead to the increased monitoring of executive directors, which will in turn help to reduce agency problems (Jensen and Meckling, 1976, Fama and Jensen, 1983b). Therefore, this will have a positive impact on firm performance (Harrison, 1987, Sun and Cahan, 2009).

This increased monitoring is achieved through the composition of these committees, as most of them are composed entirely of independent non-executive directors. This composition of these committees make them better placed to protect the interests of shareholders by effectively monitoring executive directors (Klein, 1998, Vafeas and Theodorou, 1998). In addition, due to the small size of many of these committees, they can meet more frequently and can have constructive discussions on important decisions. This enhances their effectiveness and can have a positive effect on firm performance (Karamanou and Vafeas, 2005). Furthermore, the existence of these board (monitoring) committees enhances corporate accountability, legitimacy, and credibility by performing specialist functions (Weir et al., 2002).

The contrasting theoretical proposition is that increasing the number of board committees will lead to increased costs and more agency problems (Vafeas and Theodorou, 1998, McKnight and Weir, 2009). Therefore, the increase in agency costs will negatively affect the performance of firms. Increasing the number of board committees could also result in excessive managerial supervision and a more bureaucratic decision

making process which could negatively affect the performance of firms (Goodstein et al., 1994, Vafeas and Theodorou, 1998).

ii) The empirical evidence on board committees, internal control mechanisms and firm performance

The empirical evidence on the link between board committees and firm performance is mixed. Some studies show that board committees have a positive effect on performance (e.g. Xie et al., 2003, Chen and Zhou, 2007, Chen and Lee, 2008, Sun and Cahan, 2009). Other studies show a negative relationship between board committees and performance (e.g. Core et al., 1999, Anderson et al., 2004, Huang et al., 2009, McKnight and Weir, 2009, John and Litov, 2010).

In the UK context, McKnight and Weir (2009) study the association between board nomination committees and firm performance. They report that nomination committees lead to an increase in agency costs. A nomination committee is a requirement of the UK corporate governance code. If the establishment of a committee which is recommended by the code leads to increased costs, then one could expect that the establishment of any other committee in addition to the ones recommended by the code should also lead to increased costs. On the contrary, it can be argued that any extra committees on board are established voluntarily and perhaps to meet the needs of an organisation rather than to comply with certain external regulatory requirements. Therefore, it should have a positive impact on firm performance. These arguments will be tested in this study. In the context of this study, the impact of having extra committees (in addition to a remuneration committee, an audit committee, and a nomination committee) and other internal control mechanisms on firm performance will be analysed.

iii) Recommendations of the UK corporate governance code on board committees, internal controls and hypotheses development

It is a requirement of the UK corporate governance code that listed companies should establish a remuneration committee, an audit committee, and a nomination committee. However, some listed companies also establish extra committees (e.g. executive committee, risk committee, corporate governance committee etc.) in addition to this requirement. The existing literature has only tested the relationship between board committees which are recommended by the code and the performance of firms. As yet, no study has tested the relationship between these extra board committees and the performance of firms. Therefore, this study attempts to fill this gap in the literature by analysing the impact of these extra board committees on performance. Furthermore, the association of these extra committees on board with firms' survival will also be studied in the context of the 2007–2008 financial crises.

Some of the existing literature shows that the establishment of board committees which are required by the code leads to increased agency costs. In this case, the establishment of any more committees will further increase those agency costs. On the other hand, the establishment of these extra committees might lead to greater coordination of activities, improved monitoring, and hence improved performance.

Furthermore, the UK corporate governance code also requires the FTSE350 firms to put in place a system of internal controls and carry out an annual review of the system of internal controls. Therefore, this study analyses the impact of the number of internal control mechanisms in place within an organisation on the performance of firms. The impact of the number of internal control mechanisms in place on firms' survival during the

financial crisis is also investigated in this study. Although, the number of internal controls within a firm might not indicate the quality of their internal control systems, but it would show the areas covered by it. Therefore, this could provide some insight into the effort which the board has put in to protect the interests of shareholders. Table 2.2 shows the areas covered by the internal control systems.

Table 2.2 Areas covered by internal controls within a firm

No	Name of internal controls
1	Risk identification and evaluation
2	Investment appraisal
3	Fraud management
4	Internal audit
5	Insurance for directors
6	Group controls in place
7	Treasury management
8	Financial reporting
9	Operating company controls
10	Monitoring systems
11	Control environment
12	Information & communication
13	Group risk principles
14	Risk appetite
15	Risk governance
16	Quality and integrity of personnel
17	Executive risk committee

A greater number of internal controls within an organisation will indicate that it has strong mechanisms to manage risks and that there is greater accountability and improved monitoring. Therefore, firms with more internal controls in place should demonstrate better performance when compared with their counterparts with fewer internal controls. Furthermore, firms with a greater number of internal controls will be better placed to survive a financial crisis.

The testable hypotheses for extra board committees and internal control are given below:

H0: There is no relationship between extra board committees and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H5a: There is a negative relationship between extra board committees and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between extra board committees and firm survival during the financial crisis (2007–2008) is stated below:

H0: There is no relationship between extra board committees and firm survival during the financial crisis.

H5b: There is a positive relationship between extra board committees and firm survival during the financial crisis.

The hypothesis related to the relationship between internal controls and firm performance is stated below:

H0: There is no relationship between internal controls and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H6a: There is a positive relationship between internal controls and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between internal controls and firm survival during the financial crisis (2007–2008) is stated below:

H0: There is no relationship between internal controls and firm survival during the financial crisis.

H6b: There is a positive relationship between internal controls and firm survival during the financial crisis.

2.5.2 Leverage

i) The theoretical link between leverage and firm performance

For the purpose of this study, leverage is defined as total debt to total assets (Weir et al., 2002). There are two contrasting theoretical viewpoints regarding the relationship between leverage and firm performance. Both these viewpoints are informed by agency theory. One theoretical argument is that the levels of debt financing and the capital structure of an organisation could work as an important internal corporate governance mechanism. Jensen (1986) argues that a higher level of debt financing reduces the agency cost of free cash flows because it limits managerial discretion of spending the excess cash flows. Managerial discretion over the excess cash flows is restricted because directors will be more concerned about servicing the firm's debts. Servicing of the firm's debts is important for firms, because failure to do so could lead to bankruptcies, as well as also affecting the availability of funds in the future. Therefore, servicing the debt and interest payments serves as a monitoring force. Another benefit of debt financing is the tax deduction on interest payments (Scott 1976, Jensen and Meckling, 1976).

A contrasting view point is that high levels of debt could have negative impact on a firm's performance (Myers, 1977, Jensen, 1986, Stulz, 1990, Singh and Faircloth, 2005).

The existing literature outlines two reasons for the negative relationship between leverage and firm performance. First, it could give rise to agency costs between debt holders and directors, as well as between shareholders and debt holders. Second, managers of firms with high levels of debt could forego good investment opportunities due to the servicing of the debt (Myers, 1977, Jensen, 1986, Stulz, 1990, Singh and Faircloth, 2005).

ii) The empirical evidence on leverage and firm performance

Much like the theoretical arguments, the empirical evidence on the relationship between leverage and firm performance is also mixed. Some studies show a positive association between leverage and firm performance, while others show a negative relationship between debt and firm performance. For example, Black et al. (2012) study a sample of 88 Brazilian firms for the year ending 2004. Black et al. (2012) show that leverage (defined as total debt to total assets) is significantly positively associated with firm performance measured by Tobin's Q. Black et al. (2012) further argue that this positive affect of leverage is attributable to two factors. First, the tax benefits of debt financing lead to higher profits and increased firm value. Second, debt also restricts managers' discretion over free cash flows, because it is very important for managers to service debts. Indeed, failure to do so could jeopardise the existence of their firm. Therefore, it works as an effective monitoring tool for shareholders.

On the other hand, most studies show a negative relationship between leverage and firm performance (based on accounting measures and market-related measures). These studies include Agrawal and Knoeber (1996), Short and Keasey (1999), Weir et al. (2002), Vander Bauwhede (2009), Brav (2009), Ammann et al. (2011), Black and Kim (2012), and Coles et al. (2012). In the UK context, Brav (2009) studies a large sample (54,285 private firms, 1600 public firms) for the period 1993–2003. Brav (2009) argues that the use

of debt to finance growth in private firms is more costly. Brav (2009) outlines that debt financing is more costly in private firms due to the greater information asymmetry (between insiders and the providers of finance) and the desire to maintain control. This supports the view that high leverage could inhibit the ability of firms to pursue profitable investment opportunities resulting in the detriment of their financial performance (Myers, 1977, Jensen, 1986). Similarly, Bevan and Danbolt (2002, 2004) also report a significantly negative relationship between debt financing and profitability in the UK context.

Furthermore, some studies have analysed the association between leverage and firm survival during a financial crisis. For instance, Graham and Narasimhan (2004) analyse the association between debt financing and firm survival during the Great Depression of the 1930s, while Adams (2012) studies this association in the context of the 2007–2008 financial crisis. Both of these studies show that firms with a higher level of debt during the pre-crisis periods have a greater probability of failure during crisis times.

Therefore, consistent with this prior evidence, a negative relationship between leverage and firm performance is expected. Furthermore, a negative relationship between the level of debt during the pre-crisis periods and firm survival during a crisis is also expected. With this in mind, the hypothesised link between leverage and firm performance is as follows:

H0: There is no relationship between leverage and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H7a: There is a negative relationship between leverage and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

The hypothesis related to the relationship between leverage and firm survival during the financial crisis (2007–2008) is stated below:

H0: There is no relationship between leverage and firm survival during the financial crisis.

H7b: There is a negative relationship between leverage and firm survival during the financial crisis.

2.5.3 Link between corporate governance indices and the performance of firms

In the last section, individual corporate governance mechanisms and their association with the performance of firms was discussed. However, this approach to studying the link between internal corporate governance mechanisms and performance has been criticised. The major criticism is that it is unlikely that a single characteristic (such as board size, composition, compensation etc.) can measure the overall quality of the corporate governance of a firm. Therefore, a composite measure (index) should provide more information about the corporate governance of the firm (Bikiris and Doukakis, 2011).

Moreover, the introduction of corporate governance codes around the world since the early 1990s has also encouraged researchers as well as commercial organisations to measure the corporate governance quality of firms using corporate governance compliance or non-compliance indices. Therefore, indices developed by commercial organisations as well as researchers have been widely used in the existing literature to study the link between internal corporate governance and the performance of firms.

However, the results of these studies are mixed. Studies carried out in different countries and in different time periods have produced conflicting results. Bozec and Bozec (2012) provide a comprehensive review of the literature on the use of corporate governance indices in America, Europe, and emerging economies. Bozec and Bozec (2012) report that studies conducted in emerging markets generally show a positive link

between corporate governance and performance. On the other hand, studies carried out in Europe, USA and Canada reveal mixed results.

The use of corporate governance indices started with Gompers et al. (2003), who use this approach on a sample of US firms. Gompers et al. (2003) use 24 distinct corporate governance provisions for a sample of 1500 firms from 1990 to 1998. They develop a corporate governance index called the G-index which measures the balance of power between managers and shareholders. Gompers et al. (2003) report that the corporate governance index is strongly associated with stock returns and each one point increase in the G-index (a higher G-index means lower shareholder rights protection) is associated with a 2.2% decrease in Tobin's Q (firm value). Gompers et al. (2003) also report that an investment strategy that buys firms in the lowest decile of the G-index (strongest shareholder rights) and sells firms in the highest decile (weakest shareholder rights) can earn an abnormal return of 8.5% per year.

Similarly, Cremers and Nair (2005) also report that better governed firms report a higher shareholder returns and have higher market value in the US. Bebchuk et al. (2009) study the relative importance of the 24 provisions used by Gompers et al. (2003) in a different sample period (1999 to 2003). They report that weak corporate governance is significantly associated with the lower valuation of firms. Other US studies providing empirical support for the results of Gompers et al. (2003) include Gillan et al. (2004), Aggarwal et al. (2010), and Bruno and Claessens (2010).

On the other hand, some US based studies have challenged the validity of the Gompers et al. (2003) findings. For example, Core et al. (2006) extend the Gompers et al. (2003) index to include year 1999. They re-examine the Gompers et al. (2003) findings that weak shareholder rights lead to significant stock market underperformance. After controlling for takeover activity they reject the hypothesis that weak corporate governance

leads to stock market underperformance. Similarly, Bhagat and Bolton (2008) use the same 24 provisions as used in Gompers et al. (2003). After controlling for the endogenous relationship between corporate governance and firm performance Bhagat and Bolton (2008) fail to find any significant relationship between the composite index and stock market performance.

In the UK and Europe, very limited research has been carried out using corporate governance indices and the results of these studies are mixed. Bauer et al. (2004) use the Deminor governance ratings (300 different governance criteria are included in this index) for a sample of 123 European companies (FTSE Europstar 300) for the period 2000 to 2001. Using net profit margin and return on equity as measures of performance, Bauer et al. (2004) report a negative relationship between compliance and the performance of firms.

Using the same index employed by Bauer et al. (2004), Vander Bauwhede (2009) analyses the relationship between corporate governance and the performance of firms for 118 firms listed on FTSE Europstar 300. Vander Bauwhede (2009) use return on assets (ROA) instead of return on equity (ROE) and net profit margin (NPM) used by Bauer et al. (2004). Contrary to Bauer et al. (2004), Vander Bauwhede (2009) reports a positive relationship between compliance and ROA. Vander Bauwhede (2009) argues that the negative relationship reported by Bauer et al. (2004) is caused by the performance measure they have used. Vander Bauwhede (2009) further argues that as opposed to ROE and NPM used by Bauer et al. (2004), ROA is less influenced by the sale of extraordinary items. Therefore, it is less likely that management in a poorly governed firm will be able to manipulate their firm's reported earnings.

Beiner et al. (2006) construct a compliance index based on 38 provisions of the Swiss Code of Best Practice for a sample of 109 Swiss companies for the period 2002–2003. Beiner et al. (2006) construct the compliance index by giving a value of one for

compliance with each provision and zero for non-compliance. Therefore, a high index score means higher level of compliance with the Swiss Code. Beiner et al. (2006) report a positive relationship between the level of compliance and firm performance measured by Tobin's Q.

In addition to developed economies, many studies have also been carried out in emerging economies. As reported by Bozec and Bozec (2012), studies carried out in emerging markets predominantly show a positive link between corporate governance and firm performance. For example, Black (2001) studies a sample of 21 Russian firms for the year 1999. Black (2001) uses a corporate governance index developed by an investment bank. Black (2001) shows a significantly positive relationship between the corporate governance and firm value.

More recently, Cheung et al. (2010) study a sample of 168 listed firms in Hong Kong for the period 2002–2005. Cheung et al. (2010) construct a corporate governance index based on the OECD *principles of corporate governance*. Their corporate governance index covers five categories; rights of shareholders, equitable treatment of shareholders, role of stakeholders, disclosure and transparency, and responsibilities of the board. These five categories cover 86 different corporate governance provisions. Cheung et al. (2010) report a positive relationship between their corporate governance index and company performance measured by abnormal stock returns. Other studies showing a positive relationship between corporate governance indices and performance include, Baek et al. (2004) for South Korea, Black et al. (2006) for Russia, and Garay and Gonzalez (2008) for Venezuela.

Although most studies carried out in the emerging markets show a positive relationship between corporate governance and performance, some recent studies provide contrasting results. For example, Price et al. (2011) study a sample of 107 Mexican listed

firms for the period 2002–2004. In line with the existing literature, Price et al. (2011) develop a corporate governance index based on the level of compliance with the Mexican code of corporate governance. Price et al. (2011) report that compliance with the Mexican code is not associated with firm performance (measured by ROA and Tobin's Q).

Black et al. (2012) study the relationship between compliance and performance measured by Tobin's Q for 88 firms listed on the Brazilian stock exchange Bovespa during 2004. Black et al. (2012) find no association between their compliance index and firm performance. However, when Black et al. (2012) subdivide their sample based on industry, size and growth opportunities, they report that corporate governance is associated with firms' market value only for non-manufacturing, small and high growth firms. The findings of Black et al. (2012) provide support to the view that corporate governance is an endogenous choice for firms. Therefore, a set of governance mechanisms which are effective in one organisation might not be effective in another organisation.

In the UK context, literature on the link between corporate governance indices and performance is very limited. Shabbir and Padgett (2008) study 122 non-financial firms listed on FTSE 350 for the period 2000–2003 using two market based and two accounting based measures of performance. They analyse the association between compliance with the UK corporate governance code and firms' performance. Shabbir and Padgett (2008) report a statistically significant and positive relationship between compliance with the code and firms' market value measured by total shareholder returns (TSR). However, Shabbir and Padgett (2008) fail to find any significant relationship between the level of compliance and the other performance measures used.

Similarly, Arcot and Bruno (2006) also study the impact of non-compliance with the UK corporate governance code for a sample of 245 non-financial FTSE350 listed firms over the period 1998–2003. They use industry adjusted ROA as a measure of a firm's

performance. Arcot and Bruno (2006) take into account the type of explanation provided by firms. Therefore, if a firm is non-compliant due to ‘genuine circumstances’, it receives the same index score as a fully compliant firm. In contrast with Shabbir and Padget (2008), Arcot and Bruno (2006) report that non-compliant firms outperform compliant firms. They also report that mechanical compliance (defined as a box ticking exercise) does not always lead to superior performance.

To my knowledge, there are no other academic studies which have analysed the association between a compliance index and performance in the UK context. Both of the UK related studies cited above analyse only the non-financial sector. In addition, they also study the association between compliance and performance in a relatively stable economic time period. Furthermore, the index developed by Arcot and Bruno (2006) is highly subjective as it is dependent on how ‘genuine circumstances’ are defined. Therefore, their results should be interpreted with caution.

This study will contribute to the existing debate by studying a much larger sample of the FTSE 350, which includes both financial and non-financial firms, for a period of eight years (2003–2010). This study’s unique contribution comes from the sample period covered, as it covers a relatively stable economic time period before the financial crisis which commenced in 2007 as well as a challenging and unstable time period when the financial crisis materialised. This provides an opportunity to analyse how compliance with the UK corporate governance is associated with firms’ performance in two different time periods of economic activity.

H0: There is no relationship between the level of non-compliance with the UK corporate governance code and firm performance (as measured by Tobin’s Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

H8a: There is a negative relationship between the level of non-compliance with the UK corporate governance code and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.

A few studies have also analysed the relationship between internal corporate governance mechanisms and firm survival in the context of extraordinary times such as an economic downturn or a period of industry decline. As discussed earlier, the results of these studies show that weak corporate governance mechanisms could increase a firm's probability of failure during difficult times (e.g. Filatotchev and Toms, 2003, Lemmon and Lins, 2003, Gompers et al., 2003, Graham and Narasimhan, 2004, Erkens et al., 2012, Adams, 2012).

To my knowledge, there is no study which has analysed the association between the level of compliance with the UK corporate governance code and firm survival during a financial crisis. Therefore, this study will fill this gap in the existing literature. This study aims to analyse the impact of non-compliance with the UK corporate governance code on the survival of the UK listed firms in the financial crisis, which started in 2007. Therefore, the null hypothesis is stated below:

H0: There is no relationship between non-compliance with the UK corporate governance code and firm survival in a crisis period.

H8b: There is a negative relationship between non-compliance with the UK corporate governance code and firm survival in a crisis period.

2.6 Summary

The chapter started with the introduction of corporate governance and its various definitions. In the light of agency theory, resource dependence theory, and stewardship theory, the theoretical link between internal corporate governance mechanisms and the performance of firms was discussed. In Section 2.3 of the chapter, the development of the UK corporate governance was also outlined.

In Section 2.4 of the chapter, various themes of research on the link between internal corporate governance mechanisms and the performance of firms were discussed. In Section 2.4 of the chapter, the theoretical and empirical literature in each theme was also reviewed. The review of this literature outlined the gaps in the existing literature and led to the development of testable hypotheses.

The next chapter will discuss the methodology adopted to test these hypotheses. The next chapter will also explain the econometric techniques used to test these hypotheses. Furthermore, the data collection methods, variables description, data sources, and sample size of the study will also be discussed in the next chapter.

Chapter 3 Data and Methodology

3.1 Introduction

After reviewing the literature and stating the research hypotheses in the last chapter, this chapter describes the philosophical perspective of the study, sample selection, sources of data, data collection, and the methodology adopted to answer the research questions. The chapter also describes the dependent and independent variables used in the study as well as the expected correlations between dependent and independent variables. There are three models used to test the hypotheses of the study. The first model analyses the relationship between compliance with the UK corporate governance code and the performance of firms in the pre-crisis period (2003–2006). The second model analyses the same relationship in the financial crisis period (2007–2010). Finally, the third model analyses the relationship between the level of compliance with the UK corporate governance code and firms' survival during the financial crisis.

The rest of this chapter is organised as follows. Section 3.2 discusses the methodology adopted in this study. Section 3.2 also outlines the philosophical perspective adopted and the econometric model used. Section 3.3 explains the variables used in the study and the data sources. Finally, Section 3.4 summarises the chapter.

3.2 Methodology

3.2.1 Philosophical Perspective

There are two main philosophical traditions in social science research which influence the choice of research methods. These traditions are: positivism and social constructionism (Easterby-Smith et al., 2002). These two research traditions differ from one another in terms of the assumptions they make regarding the nature of reality

(ontological assumptions), the researcher's role (epistemological assumptions) and the research process (methodological assumptions) (Saunders et al., 2012).

Positivism assumes that the social world exists externally, and to understand it its properties should be measured through objective methods (Easterby-Smith et al., 2002). Therefore, the philosophy of positivism normally leads to working with an observable social reality where the research outcomes can be generalised in a way similar to physical and natural science research (Saunders et al., 2012). This paradigm is characterised by quantitative or scientific approaches in order to explain, predict and analyse testable hypotheses relating to associations between measurable variables, since it assumes that reality is 'objective' or independent of observers (Easterby-Smith et al., 2002).

On the other hand, the key assumption of social constructionism (also called interpretivism) is that the social world is not external and 'reality' is socially constructed and given meaning by people (Easterby-Smith et al., 2002). Therefore, in this paradigm, social reality is assumed to be 'subjective' or dependent on observers. This is because the observers are normally part of what is being observed (Rabe-Hesketh and Skrondal, 2008). Similarly, Easterby-Smith et al. (2002) state that in social constructionism the researcher attempts to understand the point of view from the subjects' perspective. Therefore, the researchers try to study meaningful social actions, rather than just the external or observable behaviour of people, in order to study complex relationships in a social phenomenon.

The proponents of social constructionism argue that this philosophical assumption is relevant to business and management research, since business situations are complex, unique, and are a function of a particular set of circumstances and individuals (Saunders et al., 2012). As reality is socially constructed (Easterby-Smith et al., 2002), therefore, "the

interpretivism approach is necessary to explore the subjective meanings motivating people's actions in order to be able to understand these" (Saunders et al., 2012, p.84).

These two different philosophical traditions lead to different research questions and research methodologies. As Crotty (1998) states, epistemologies, theoretical perspectives, research questions, research designs, and methods of data collection are all interrelated and inform one another. This suggests that in some cases to answer research questions it might be more appropriate to adopt a positivist approach while in other cases adopting a social constructionist approach could be more appropriate. The epistemological approach adopted would then influence the choice of methodology and the methods used to carry out the research.

Traditionally, positivist methodologies and econometric analysis are used to analyse the associations between variables which are measured quantitatively. This study investigates the relationship between internal corporate governance mechanisms and firms' financial and operating performance. All the variables are quantitatively measured over a long period (2003–2010) for a sample of 274 companies, and the model in the study is based on a number of dependent and independent variables.

Furthermore, the study seeks to test the theoretical assumptions regarding the association between internal corporate governance mechanisms and the performance of firms. Hypothesis testing is used to answer the research questions of the study, which is an integral part of the positivist research paradigm (Easterby-Smith et al., 2002). Therefore, due to the economic and observable nature of data and variables, sample size, the number of variables in the model and the time period the study covers, the positivist approach and quantitative methods are the appropriate and logical choices with which to answer the research questions of the study.

Other reasons for not using qualitative methods for this study are, first, as mentioned earlier the research involves hypotheses testing, and it is therefore more appropriate to use quantitative methods to answer them (Easterby-Smith et al., 2002). Second, the large sample of 274 firms over 8 years means that qualitative methods are inappropriate for use here. Second, the confidential nature of board meetings and processes makes it hard for researchers to get access to observe board proceedings for the purpose of assessing corporate governance of firms.

3.2.2 The relationship between corporate governance and performance

Adopting a positivistic approach, the link between corporate governance and the performance of firms in corporate finance literature is predominantly studied by using quantitative methods. In this regard, some researchers have examined the link between internal corporate governance and the performance of firms by taking into account individual governance mechanisms (e.g. Agrawal and Knoeber, 1996, Yermack, 1996, McKnight and Weir, 2009, Mangena et al., 2012, Gulamhussen et al., 2012). Using this approach, the impact of individual corporate governance mechanisms (such as CEO duality, board size, board compensation, board ownership etc.) on the performance of firms is analysed.

On the other hand, many studies have used the compliance index approach to study the association between corporate governance and the performance of firms (e.g. Gompers et al., 2003, Brown and Caylor, 2006, Bhagat and Bolton, 2008, Shabbir and Padgett, 2008, Bebchuk et al., 2009, John and Litov, 2010, Cheung et al., 2010, Price et al., 2011, Black et al., 2012). The use of a compliance index approach in the corporate governance research began following the development of corporate governance codes around the world

(such as the Sarbanes-Oxley Act 2002 in the USA, and The UK corporate governance code).

These corporate governance codes around the world recommend codes of best practice for firms. In some countries, adopting these codes of best practice is compulsory (e.g. in the USA). Therefore, every listed company is required to comply with the recommended code of best practice. In other countries, compliance with these codes of best practice is voluntary (e.g. UK and other European countries). In this case, listed companies are required to report their compliance or otherwise explain the reasons for non-compliance in their annual reports.

The development of these codes of corporate governance has led to the construction of corporate governance compliance indices. Companies are rated based on the level of compliance with their respective corporate governance code. These compliance indices are then used as a proxy for the quality of corporate governance of companies and therefore provide a basis for assessing the relationship between governance and the performance of firms.

In addition, some studies have adopted event study methodology introduced by Fama et al. (1969) in order to study stock market reaction to the adoption of certain corporate governance structures by listed firms (e.g. Lambert and Larcker, 1985, Rosenstein and Wyatt, 1990, Glen et al., 2001, Bauer et al., 2004, Schultz et al., 2010). The event study methodology is not adopted in this research due to two main reasons. First, the objective of the study is to analyse whether or not level of compliance with the UK corporate governance code affects the performance of firms (operating and financial) in two economically different time periods, rather than to analyse the stock market reaction to certain corporate actions. Second, although market based measures (Tobin's Q and TSR) are used in the study, which will capture the impact of compliance with the UK corporate

governance code on shareholders' wealth, these proxies measure the long term impact of corporate governance on shareholders' value rather than abnormal returns in the short term around a certain event. In light of these points, the use of event study methodology is not deemed appropriate for this research.

As stated in the previous sections, the main aim of this study is to analyse how compliance with the UK corporate code could affect the financial and operating performance of firms. The UK Listing Authority (UKLA) requires all listed companies to report their compliance with the UK corporate governance in the annual reports. This makes the index approach appropriate in this situation, because the level of compliance will be different for each company and the index could provide an indication of a company's corporate governance mechanisms. However, to make the results of the study comparable to the existing literature, certain individual internal corporate governance mechanisms, in addition to the non-compliance index, will also be taken into account.

The basic assumption of the corporate governance index approach is that internal corporate governance mechanisms are externally imposed, and firms tend to choose governance structures as a set to comply with these external requirements (Danielson and Karpoff, 1998). This is particularly true in the case of the USA where compliance with the Sarbanes-Oxley Act 2002 is mandatory for all listed firms. On the other hand, in the UK and many other countries which follow the principles-based system of corporate governance, firms have a choice to comply with some provisions of the country specific codes and choose not to comply with others. Therefore, the assumption that corporate governance mechanisms are externally imposed, and that firms tend to choose them as a set seems to be too strong. Hence, the use of a compliance index might not be appropriate in such cases.

However, the compliance index approach is considered to be the appropriate choice for this study because the purpose of the study is to analyse the impact of the overall level of compliance with the UK corporate governance code on firms' performance. Therefore, it is important to look into the internal corporate governance mechanisms of firms as a set, and to measure the level of non-compliance of each firm. This provides an opportunity to gain some insight into whether firms which comply with the code perform better than those firms which provide explanations for non-compliance or vice versa.

The index approach also assumes that there might be interdependencies between different internal corporate governance variables (Agrawal and Knoeber, 1996). As a result, studying the link between individual governance mechanisms and the performance of firms by looking at single corporate governance mechanisms in isolation will not provide valid results. Therefore, it is important to construct an index containing a comprehensive set of governance provisions with which to investigate the link between corporate governance and performance (Gillan, 2006, Shabbir and Padgett, 2008).

Therefore, in line with the existing literature, the compliance index approach will be used to study the link between internal corporate governance and the performance of firms.

3.2.3 Econometric model used to study the governance performance link

Research on the link between internal corporate governance mechanisms and the performance of firms is dominated by the positivistic approach. As discussed earlier, Crotty (1998) outlines that adopting the positivistic approach will lead to certain methodologies and methods being adopted. In addition, Easterby-Smith et al. (2002) explain that the positivist paradigm is characterised by quantitative or scientific approaches

with which to explain, predict and analyse testable hypotheses related to associations between measurable variables. Therefore, the positivistic approach adopted in the existing corporate governance literature has led to the use of secondary data, hypotheses testing and regression analysis on the link between corporate governance and performance.

As discussed in Section 2.2, agency theory, resource dependence theory and stewardship theory predict that the internal corporate governance mechanisms of a firm can impact its performance. To investigate this impact, regression analysis has been used in this study.

In the regression analysis, the quality of corporate governance is used as an independent variable whilst firm performance is used as a dependent variable. The quality of corporate governance is measured by using an index approach as well as a number of individual corporate governance mechanisms (e.g. board size, board composition, board ownership, leverage etc.). The performance of firms is measured by using accounting data and stock market data. Secondary data is used to measure all the variables of the study whilst the link between corporate governance and performance is also studied with the help of econometric analysis.

Gujrati (2003) states that generally three types of data are available for empirical analysis: time series, cross-section, and pooled. A *time series* is a set of observations on the values which a variable takes at different time. *Cross section* data are data on one or more variables collected at the same point in time. While *pooled data/panel data* is a combination of cross section and time series data. All these three types of data have been used extensively in the existing literature and each type of data leads to the implementation of different regression models.

As stated earlier, this research covers a period of eight years for 274 firms. Therefore, the data is both cross sectional and time series i.e. panel data (Gujarati, 2003). Panel data allows the researcher to control for the effect of variables which cannot be observed or measured, such as differences in business practices across companies or variables which change over time but not across entities (i.e. national policies, federal regulations etc.). As these unobserved effects (also called unobserved heterogeneity (Wooldridge, 2002)) cannot be measured, so it leads to correlation between independent variables and error term in the case of panel data (Wooldridge, 2002). When one of the independent variables is correlated with the error term of regression it is called an endogenous variable. Therefore, it violates one of the basic assumptions of ordinary least square regression (OLS) i.e. the error term should not be correlated with any of the explanatory variables.

Due to the presence of unobserved heterogeneity, OLS will produce inconsistent results (Gujarati, 2003). To overcome this problem generally two regression models have been used in the existing literature. First, regression models with instrumental variables¹⁶, a second, panel data estimation (fixed effects, and random effects models).

In order for a variable to be used as an instrumental variable, Wooldridge (2002) states that two conditions must be satisfied. First, the instrumental variable must be uncorrelated with the error term. Second, it should be partially correlated with one of the endogenous variables. However, Wooldridge (2002) further states that it is extremely difficult to find an instrumental variable which satisfies these two conditions. Therefore, the instrumental variable approach is difficult to implement.

¹⁶ Instrumental variable is a variable that is correlated with the endogenous explanatory variable but is not correlated with the error term of regression (Wooldridge, 2002).

Panel data estimation can take such heterogeneity explicitly into account and produce consistent results. The two main approaches to the fitting of models using panel data/longitudinal data are known as fixed effects regression and random effects regression (Dougherty, 2007). In a fixed effects model it is assumed that α (firm specific effects, such as managerial style, organisational structure etc.) differ between firms and are time invariant. Wintoki et al. (2012) argue that fixed effects estimation can eliminate the bias arising from the unobservable heterogeneity. In a random effects model, the constant α is a random outcome variable which has a cross section specific error component and is uncorrelated with the errors of the regressor variables (Wooldridge, 2002).

Hausman (1978) developed a test to decide between using fixed effects and random effects models. The key consideration when choosing between a random effects and fixed effects approach is whether the error term is correlated with any of the explanatory variables (Wooldridge, 2002). To test whether the error term is correlated with any of the explanatory variables, the Hausman specification test is commonly used in the existing literature. If the Hausman test is significant, this means that the error term is correlated with the regressor, and therefore fixed effects should be used. On the other hand, if the Hausman test is not significant, this means that the error term is uncorrelated with the regressor and a random effects approach should be used (Wooldridge, 2002).

Empirical corporate finance research, which attempts to explain the causes and effects of financial decisions, often has serious issues with endogeneity. Recent literature shows that “it is generally difficult to find exogenous factors or natural experiments with which to identify the relations being examined” (Wintoki et al., 2012, p. 582). The presence of endogeneity leads to inconsistent estimates and unreliable inferences (Roberts and Whited, 2011). The three main sources of endogeneity are: unobservable heterogeneity, simultaneity and the possibility that past firm performance affects the

current value of governance variables (Gujarati, 2003). Fixed effects models can potentially eliminate the bias arising from unobservable heterogeneity (Wintoki et al., 2012). To address the two other sources of endogeneity, lagged values of past performance will be used in the model.

As discussed in previous sections, one purpose of the study is to investigate the association between compliance with the UK corporate governance code and the performance of firms (financial and non-financial firms) over two economically different time periods i.e. 2003–2006 and 2007–2010. Therefore, one model will be based on the time period 2003–2006 whilst the other model will be based on 2007–2010. Furthermore, financial and non-financial firms will be entered into the model separately so as to take into account the differences in their corporate governance mechanisms.

The general fixed effects regression model of the study is given below:

$$\begin{aligned} \text{Performance}_{it} = & \alpha_i + \beta_1 \text{NCI}_{it} + \beta_2 \text{size}_{it} + \beta_3 \text{nextratio}_{it} + \beta_4 \text{remun}_{it} + \\ & \beta_5 \text{boardown}_{it} + \beta_6 \text{lev}_{it} + \beta_7 \text{extcmmtt}_{it} + \beta_8 \text{intctlm}_{it} + \beta_9 \text{beta}_{it} + \beta_{10} \text{logsales}_{it} + \\ & \beta_{11} \text{liq}_{it} + \beta_{12} \text{capital}_{it} + u_{it} \quad \dots\dots\dots \text{Eq (1)} \end{aligned}$$

Where the constant α_i represents unobservable individual firm-specific effects which differ between firms and are time invariant, $i = 1 \dots N$ firms, $t = 1 \dots T$ time periods and u_{it} is a normal error term. Performance is measured by Tobin's Q, return on assets (ROA), return on equity (ROE), and total shareholder returns (TSR). The independent variables are, non-compliance index (nci), board size (size), Beta (beta), board independence (nextratio), remuneration (remun), board ownership (boardown), leverage (lev), control for firm size (logsales), liquidity (liq), capital (the ratio of total equity to total assets), the existence of extra committees on board (extcmmtt), and the internal control

mechanisms in place (intctlm). Each of the dependent variables in equation (1) i.e. Tobin's Q, ROA, ROE, and TSR, will be entered into the model separately.

As reported by Shleifer and Vishny (1997), Denis (2001), and Wintoki et al. (2012), most of the studies which relate corporate governance mechanisms to firm performance suffer from endogeneity. This means that the causality may run in both directions. For example, changes in firm performance could trigger changes in the board of directors' size, composition and compensation rather than the other way around. To overcome this frequently cited problem of endogeneity, many studies have adopted a lagged performance approach (Hermalin and Weisbach, 1991, Himmelberg et al., 1999, Coles et al., 2008, McKnight and Weir, 2009). In line with these studies, this study will also adopt the same approach. The corporate governance variables will be lagged for three years to overcome the endogeneity problem between firm performance and internal corporate governance mechanisms.

The regression equation for lagged independent variables is given below:

$$\begin{aligned} \text{Performance}_{it} = & \\ & \alpha_i + \beta_1 \text{NCl}_{it-3} + \beta_2 \text{size}_{it-3} + \beta_3 \text{nedratio}_{it-3} + \beta_4 \text{remun}_{it-3} + \beta_5 \text{boardown}_{it-3} + \\ & \beta_6 \text{lev}_{it-3} + \beta_8 \text{extcmmt}_{it-3} + \beta_9 \text{intctlm}_{it-3} + \beta_{10} \text{beta}_{it-3} + \beta_{11} \text{logsales}_{it} + \beta_{12} \text{liq}_{it} + \\ & \beta_{13} \text{capital}_{it} + u_{it} \quad \dots\dots\dots \text{Eq (2)} \end{aligned}$$

The definitions of the dependent and independent variables in Eq (2) are the same as those provided in Eq (1).

As discussed in Section 1.2, the second purpose of the study is to investigate how compliance with the UK corporate governance code and different internal corporate governance mechanisms affects the survival of firms during the financial crisis. To measure “*survival*” during a crisis, it is defined in the following way. A firm is considered

to have survived the financial crisis if it did not receive any government bailouts (Adams, 2012), came out of the recession as a going concern (i.e. did not go bankrupt) or was not de-listed, or did not carry out any major corporate actions (e.g. mergers and acquisitions, and shares issues during the financial crisis).

The relationship between corporate governance and the survival of firms is analysed by adopting the average cross sectional methodology developed by Rajan and Zingales (1995) and then used by Florackis and Ozkan (2008). Specifically, the dependent variable is measured at any time after 2007, while the independent variables are measured for the period 2003-2006 (Florackis and Ozkan, 2008). Furthermore, as the dependent variable, firm survival is a binary variable that can only take a value of 1 or 0. The data used in this study does not meet the assumptions made in the OLS models. Therefore, a logistic regression model is used to analyse the association between internal corporate governance mechanisms and firm survival (Graham and Narasimhan, 2004).

When the dependent variable is a binary outcome, ordinary least square (OLS) cannot be used for the following reasons (Gujarati, 2003). First, in OLS for statistical inferences, the assumption is that the error term u_i is normally distributed. But this assumption of “normality for u_i is not tenable in the case of the binary outcome variable because, like the outcome variable, u_i also takes only two values i.e. they also follow the Bernoulli distribution” (Gujarati, 2003, p.584). Second, when the outcome variable is binary, it leads to heteroscedasticity (i.e. an uneven spread of error terms for different values of the independent variables) in the error term. Therefore, in the presence of heteroscedasticity, OLS estimations are inefficient. As OLS cannot be used in this study due to the reasons discussed above, the following logistic regression model is estimated in this study:

$$\text{Survival}_i = \frac{1}{1 + e^{-(\beta_1 \text{NCl}_i + \beta_2 \text{size}_i + \beta_3 \text{nedratio}_i + \beta_4 \text{remun}_i + \beta_5 \text{boardown}_i + \beta_6 \text{lev}_i + \beta_7 \text{extcmmt}_i + \beta_8 \text{intctlm}_i + u_i)}}$$

.....Eq (3)

Where *Survival_i* in Eq (3) is the probability of a firm surviving in the crisis period, and the remaining variables are defined in the same way as in Eq (1).

As mentioned earlier, it is expected that firms complying with the UK corporate governance code would have good governance mechanisms in place and therefore, are more likely to survive the crisis. Hence a negative relationship between the probability of firm survival and the non-compliance index is expected.

Similarly, a negative relationship between large BODs and probability of firm survival is expected, as large boards are dysfunctional and ineffective (Jensen, 1993). On the other hand, a positive relationship is expected between the ratio of NEDs and the probability of firm survival (Byrd et al., 2001). Similarly, it is expected that higher levels of compensation during the pre-crisis period should lead to greater probability of survival, while a negative relationship between BODs ownership and firm survival is hypothesised, because firms with a high level of managerial ownership are more risky (e.g. Morck et al., 1988 , Short and Keasey, 1999, Denis et al., 2006, Bergstresser and Philippon, 2006, Adams, 2012).

Furthermore, it is expected that the existence of extra board committees and the number of internal control mechanisms on board are positively associated with firms' survival during a crisis period. Firm size and liquidity in the pre-crisis period are expected to be positively related to survival during a crisis. This is because larger and more liquid firms are more likely to survive difficult times, as they will have more resources to cope

with difficult economic times (Shumway, 2001). However, leverage is expected to be negatively correlated with firm survival during a crisis, because it is more difficult to arrange for new credit. It is also difficult to pay off existing debts during difficult times as firms would have limited availability of free cash flows during financial crisis (Hunter, 1982, Graham and Narasimhan, 2004).

3.3 Data and Variables

3.3.1 Sample and data collection

As stated earlier, one purpose of this study is to analyse how the level of compliance with the UK corporate governance code affects the financial and operating performance of FTSE350 firms. The second purpose of the study is to look into the association between the level of compliance with the UK corporate governance code and the survival of firms during financial crisis.

As most of the corporate governance mechanisms normally affect organisations in the long run, studies based on cross sectional data could provide misleading results on the relationship between corporate governance and firm performance. For example, any changes in board size or composition would normally take some time to affect firm performance (Graham and Narasimhan, 2004). Similarly, Shabbir and Padgett (2008) argue that using cross sectional data to study the relationship between compliance and performance would fail to provide clear answers. They also mention that this is a weakness in most of the UK based studies which analyse the relationship between compliance and performance. In order to address these issues, data for each of the companies in our sample is collected for the pre-crisis period 2003 to 2006 as well as for the crisis period 2007 to 2010.

The target population is based on the FTSE 350 listed companies. The FTSE350 is selected as a target sample due the following reasons. First, the FTSE350 represents approximately 96% of the market capitalisation of firms listed on the London Stock Exchange¹⁷. Therefore, the results of the study could be considered as representative of the whole UK market. Second, as part of the listing requirements in the UK, all the FTSE350 companies either have to comply with the UK corporate governance code, or if not, must explain their reasons for non-compliance. Smaller companies which are not part of the FTSE350 are not required by the UK Listing Authority (UKLA) to report their compliance with the UK corporate governance code; hence, these companies are excluded from the sample. Third, no study has analysed the impact of compliance with the UK corporate governance code in two economically different time periods, especially in the context of the recent financial crisis.

The sample is composed of those companies which were listed on FTSE350 for the period 2003–2010. This may give rise to survivorship bias (i.e. the bias which arises from concentrating only on the companies that were listed for the whole period of 2003–2010). However, the study involves a comparison between two time periods i.e. before the crisis (pre-2007) and during the crisis (post-2007). In light of this, it is important that the sample includes the same set of companies before and after 2007, which will make the comparison more meaningful.

Data regarding the FTSE350 constituent list for each year (2003–2010) was requested from the London Stock Exchange. After applying the sample selection criteria, a total of 284 listed companies including utilities were identified. Utility companies are heavily regulated, and these regulations may impact differently on their corporate

¹⁷ http://www.ftse.com/Indices/UK_Indices/index.jsp

governance and performance and are excluded in most studies (Yermack, 1996, Cheng et al., 2008, Aebi et al., 2012). Therefore, utilities are excluded from the final sample. After excluding the utilities, the final sample consists of 274 firms. This is composed of 188 non-financial and 86 financial firms. Table 3.1 provides the number of firms from each industry using the FTSE Industry Classification Benchmark (ICB).

Table 3.1 Based on Industry Classification Benchmark (ICB), the number of sample firms from each industry

ICB	Industry name	Number of Companies	Percentage
1	Oil and Gas	15	5.28
1000	Basic Materials	12	4.23
2000	Industrials	61	21.48
3000	Consumer Goods	27	9.51
4000	Health Care	5	1.76
5000	Consumer services	49	17.25
6000	Telecommunications	4	1.41
7000	Utilities	10	3.52
8000	Financials	86	30.28
9000	Technology	15	5.28
Total		284	100
The final sample after excluding Utilities			
Total		274	

Data for this study is collected from four sources, Morningstar Company Intelligence (previously known as Hemscott Guru Database), companies' annual reports, DataStream, and Companies House. Data for compliance with the UK corporate governance code were collected from the annual reports of each company. These annual reports were mostly downloaded from Morningstar Company Intelligence. Annual reports for some years were not available with Morningstar Company Intelligence; in that case they were downloaded from the company websites. For the seventeen companies which were acquired or delisted after 2007–2008, annual reports were not available from

Morningstar Company Intelligence or from their companies' websites. In these cases, annual reports were requested from Companies House.

Similarly data for other corporate governance variables i.e. board size, board composition, remuneration, and director shareholdings were collected from Morningstar Company Intelligence, whereas the financial data were collected from DataStream.

3.3.2 Explanatory variables

Gompers et al. (2003) used a governance index (G-Index) as an explanatory variable to study the relationship between internal corporate governance mechanisms and firm performance. Following this, many studies have used the same methodology to study the association of corporate governance index with firm performance. Other studies which have developed and used such an index of corporate governance include Brown and Caylor (2006), Bhagat and Bolton (2008), Shabbir and Padgett (2008), Bebchuk et al. (2009), John and Litov (2010), Cheung et al. (2010), Price et al. (2011), and Black et al. (2012). The advantages of using a governance index as mentioned by Gompers et al. (2003) are as follows. First, the index assigns equal weight to all provisions, and as such does not require any judgments about the effects of any of the provisions. Second, the index is transparent and easily reproducible, and the construction of the index is straightforward.

However, the disadvantage of such an index could be that shareholders might consider one corporate governance provision to be more important than another given provision, and could therefore value compliance with such a provision more than compliance with other provisions which they consider less important. In such a case, assigning equal weights to all provisions might be misleading. However, given the large number of shareholders for each firm, and the diversity of opinions they might have

regarding each provision, it is not appropriate to weigh each provision according to shareholders' preferences. Therefore, giving equal weight to each provision could be considered as the best practical available option.

The UK corporate governance code is based on the principle of comply or explain, i.e. each company does not have to comply with all the provisions of the UK corporate governance code. Rather, each listed company on the FTSE350 has a choice either to comply with the UK corporate governance code provisions or provide an explanation for their non-compliance. Therefore, the level of compliance by firms varies¹⁸, thus creating an opportunity to analyse the impact of compliance with the code on firm performance both during normal times and during a crisis.

Therefore, due to the differences in the level of compliance for each firm and in line with the existing literature, a non-compliance index was developed for each sample firm (Shabbir and Padgett, 2008). Based on the provisions of the UK corporate governance code versions (2003, 2006, and 2008), the level of compliance of corporate governance of each firm was assessed in their annual reports and a non-compliance index was developed. The non-compliance index is set out in Section 3.3.2.1 below.

3.3.2.1 Non-compliance index

The non-compliance index (NCI) is the main explanatory variable of the study. The index is constructed by assigning one point for each occurrence of non-compliance with the UK corporate governance code. This method of constructing the corporate governance index is consistent with the existing literature (e.g. Gompers et al., 2003, Klapper and Love, 2004, Bauer et al., 2004, Brown and Caylor, 2006, Bhagat and Bolton, 2008,

¹⁸ A survey by Grant Thornton in 2008 showed that, only 44% of the FTSE350 firms fully complied with the UK corporate governance code provisions. This report is available at: <http://www.grant-thornton.co.uk/pdf/Corporate-Governance-Review-2008.pdf>

Shabbir and Padgett, 2008, Bebchuk et al., 2009). For example, the code recommends that the role of chairman and CEO should not be performed by one individual. So if a company complies with this provision a value of 0 is assigned and if not a value of 1 is assigned.

The non-compliance index is based on the 2003, 2006 and 2008 versions of the UK corporate governance code¹⁹. Principles and provisions outlined only in Section 1 of the UK corporate governance code are taken into account in constructing the index, because these provisions cover the most important internal corporate governance attributes recommended for companies in the UK. For instance, Section 1 of the UK corporate governance code covers the chairman's independence, board size, board independence, remuneration, and committee structures etc. Other sections of the UK code cover relationships with institutional shareholders, and auditors, which are difficult to quantify. They are therefore excluded from the index. A total of 22 provisions are included in the index, so the non-compliance score for each company could vary between 0 (fully compliant) and 22 (fully non-compliant). Table 3.2 summarises the UK corporate governance code's provisions included in the construction of the non-compliance index (NCI).

¹⁹ These versions of the code are available on FRC website: <http://www.frc.org.uk>

Table 3.2 Provisions from the UK corporate governance code which are included in the construction of the Non-Compliance Index (NCI)

P1	Principle A.2 of the code states that there should be a clear division of responsibilities at the head of the company between the running of the board and the executive responsibility for the running of the company's business. No one individual should have unfettered powers of decision.
P2	Principle A.2.2 of the code states that the chairman should, on appointment, meet the independence criteria set out in Section A.3.1 of the UK corporate governance code.
P3	Principle A.3.3 states that the board should appoint one of the independent non-executive directors to be the senior independent director.
P4	Principle A.3.2 states that except for smaller companies ²⁰ at least half of the board excluding the chairman should be Independent non-executive directors (INEDs).
P5	Principle A.3.2 states that the majority of non-executive directors (NEDs) should be Independent.
P6	Principles A.4.1, C.3.1, and B.2.1 state that the board should establish nomination, audit and remuneration committees.
P7	Principle A.4.6 states that a separate section of the annual report should describe the work of the nomination committee, including the process it has used in relation to board appointments.
P8	Principles A.4.1, C.3.1, and B.2 state that the audit, nomination, and remuneration committees should be headed by independent non-executive directors (INEDS).
P9	Principle A.4.5 states that executive directors should not take more than one non-executive directorship in a FTSE 100 company nor the chairmanship of such a company.
P10	Principle A.6.1 states that the board should report in the annual report how performance evaluation of the board, its committees and its individual directors has been conducted.
P11	Principle A.6.1 states that independent non-executive directors led by senior independent director should be responsible for performance evaluation of the chairman, taking into account the views of executive directors.
P12	Principle A.7.1 states that all directors should be subject to election at their first AGM, and re-election every three years.
P13	Principle B.1.1 states that performance-related elements of remuneration should form a significant proportion of the total remuneration package of executive directors and should be designed to align their interests with those of shareholders and to give these directors keen incentives to perform at the highest levels.
P14	Principle B.1.2 states that remuneration for NEDs should not include share options.
P15	Principle B.2.1 states that remuneration committee should be entirely composed of independent non-executive directors.

²⁰ A smaller company is one that is outside the FTSE 350 throughout the year immediately prior to the reporting year.

P16	Principle C.2 states that the board should maintain a sound system of internal controls to safeguard shareholders' investments and the company's assets.
P17	Principle C.2.1 states that the board should, at least annually, conduct a review of the effectiveness of the company's system of internal controls and should report to shareholders that they have done so.
P18	Principle C.3.1 states that at least three members of the audit committee should be independent non-executive directors.
P19	Principle C.3.1 states that the board should satisfy itself that at least one member of the audit committee has recent and relevant financial experience.
P20	Principle D.1.2 states that the board should report in the annual report the steps taken to ensure that the board, including the NEDs, has developed an understanding of the views of major shareholders of the company.
P21	Principle B.1.6 states that notice or contract periods should be set at one year or less.
P22	Principle C.3.2 states that the main role and responsibilities of the audit committee should be set out in written terms of reference.

Table 3.3 Variables used in the study

Symbol	Variable name	Definition
Dependent variables		
TOBIN'S Q	Tobin's Q	(Total assets + market value of equity – book value of equity – deferred taxes)/Total assets.
TSR	Total Shareholder Returns	The sum of capital gains and dividend yields.
ROE	Return on Equity Ratio	Net income divided by book value of equity.
ROA	Return on Assets Ratio	Earnings before interest and taxes (EBIT) divided by the total assets.
Independent variables		
NCI	Non-compliance index	A score ranging between 0 and 22. Showing the level of non-compliance with the UK corporate governance code.
SIZE	Board Size	The total number of directors on board.
NEDRATIO	Board composition	Ratio of NEDs on board to total board size.
BOARDOWN	Board of directors'(BOD) share ownership	The total percentage of equity shares held by all board members.
REMUN	Compensation	The total remuneration paid to directors.
LEV	Leverage	The percentage of total debt to assets.
EXTCMMTT	Extra Board committees	The number of extra committees in addition to audit, remuneration, and nomination committees.
INTCTLM	Internal Control Mechanisms Implemented	The number of internal control mechanisms in place.
Control variables		
LIQ	Liquidity	The ratio of a firm's current assets to current liabilities.
CAPITAL	Capital Ratio	Ratio of total equity to total assets.
BETA	Beta value	A measure of company riskiness.
SALES	Sales	Natural log of total sales.

3.3.3 Dependent variables

The dependent variables in the analysis include firm performance and survival during a crisis. Firm performance is measured by four proxies (Tobin's Q, TSR (total shareholder returns), ROA (return on Assets), and ROE (return on Equity)) as used by Shabbir and Padgett (2008). However, the calculation of specific measures used in the analysis differs from that used by Shabbir and Padgett (2008). For instance, in this study,

Tobin's Q is calculated as (total assets + market value of equity – book value of equity – deferred taxes) divided by total assets. This definition is the same as used by previous studies to define Tobin's Q (such as, Morck et al., 1988, Gompers et al., 2003, Bhagat and Bolton, 2008, Bebchuk et al., 2009). Shabbir and Padgett (2008) did not take into account the deferred taxes in their calculation of Tobin's Q. However, by including deferred taxes in the calculation, a more accurate valuation of firms is derived.

TSR is calculated as the sum of capital gains and dividend yields (Shabbir and Padgett, 2008). The two accounting based measures used to calculate performance are the same as those used by Shabbir and Padgett (2008). The first one is return on assets (ROA) measured as earnings before interest and taxes (EBIT) divided by the total assets. The second accounting based measure is return on equity (ROE), which is calculated as net income (net profit after tax) divided by the book value of equity.

The “*survival*” of a firm during the financial crisis was defined in the following way. A firm is considered to have survived the financial crisis if it did not receive any government bailouts (Adams, 2012), or was still operating as a going concern by the end of 2010 (i.e. did not go bankrupt) or did not carry out any major corporate actions (e.g. mergers and acquisitions, shares issues).

3.3.4 Control variables

3.3.4.1 Firm size

Firm size could affect both firms' performance and the probability of surviving difficult times. Bernanke (1983) argues that small firms are less profitable and encounter distress more often than large firms in the 1930s financial crisis. Similarly, Shumway (2001) finds that firm size is a significant predictor of bankruptcy during difficult times. However, other research shows that firm size is negatively related to market measures of

performance such as total shareholder returns (Fama and French, 1992, Vafeas and Theodorou, 1998, Weir et al., 2002).

Total sales will be used as a proxy for firm size (Shabbir and Padgett, 2008). It is expected that firm size is positively correlated with its chances of survival in crisis times, whereas it is hypothesised that firm size is negatively correlated with financial performance in the pre-2007 and post-2007 periods (Fama and French, 1992, Vafeas and Theodorou, 1998, Weir et al., 2002).

3.3.4.2 Liquidity

Liquidity (i.e. the ability of a firm to cover its short term liabilities) could have major implications for a firm's survival in difficult economic times. Therefore, liquidity will be used as a control variable in our analysis. Graham and Narasimhan (2004) found that firms with more debt had a greater probability of becoming financially distressed in the 1930s financial crisis. Similarly, Hunter (1982) argues that extra liquidity increased the probability of firms' survival during the 1930s, when credit was hard to come by. Liquidity will be measured as the ratio of a firm's current assets (cash, inventory and receivables) to current liabilities (payable in the next 12 months).

3.3.4.3 Capital

The amount of capital available to a firm could have major implications for its performance, especially in crisis situations. Beltratti et al. (2009) argue that there is a positive correlation between bank performance during the crisis (2007-2009) and its capital ratio before the crisis. Firms with more capital would have more of a cushion to absorb adverse shocks and hence would experience less financial distress. Therefore, to capture the effects of capital on firm performance, the capital ratio defined as the ratio of total equity to total assets (Beltratti et al., 2009) will be used as a control variable in this study.

3.3.4.4 Risk (Beta)

The relationship between internal corporate governance mechanisms and the performance of firms could be affected by the level of riskiness of a firm (Love, 2010). Therefore, to control for the risk, market beta (a measure of risk) is used as a control variable in the study (Welch, 2003, Beiner et al., 2006, Belkhir, 2009, Beltratti and Stulz, 2012).

The relationship between corporate governance and risk could either be positive or negative. The relationship could be positive (i.e. better governance leads to high risk), because insiders with high private benefits (in poorly governed firms) may opt to be conservative in directing corporate investments to the extent that they might not invest in value enhancing risky projects (John et al., 2008).

Alternatively, the association between governance and risk might be negative i.e. better governance leads to low risk (Bae et al., 2012). Love (2010) argues that better governance would lead to better shareholder protection, increased efficiency and greater investor confidence. The increased investor confidence means that they would be willing to accept lower return on their investments. This will translate into lower cost of capital, higher income and low risk (Love, 2010).

Similarly, Bae et al. (2012) argue that firm-level governance is negatively associated with risk as estimated by beta. This negative relationship between firm level governance and beta affects the performance of firms in two ways. First, the performance of poorly governed firms is more sensitive to changes in market conditions. Second, firms with weaker corporate governance suffer more when the market performs poorly (Bae et al., 2012). Therefore, to take into account the impact of risk, beta is included as a control

variable in this study. Beta included in this study is annual beta downloaded from the DataStream.

3.4 Summary

In this chapter, the philosophical perspective of the research was discussed in Section 3.2.1. The different alternative research paradigms were also outlined. In Section 3.2.2 the predominant methodologies used for studying the relationship between corporate governance and the performance of firms were explained.

Based on the philosophical approach adopted, Section 3.2.3 outlined the models adopted for this study, whilst Section 3.3 provided a detailed description of the sample selection and data collection methods used in the study. In Sections 3.3.2, 3.3.3 and 3.3.4, the independent, dependent, and control variables of the study were explained, whilst their measurement techniques were also discussed.

The next chapter will set out and discuss the data analysis and results of the study. The hypotheses of the study which will be tested in the next chapter are outlined below.

Table 3.4 Hypotheses of the study

Performance related Hypotheses	
H1a	There is a negative relationship between board size and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H2a	There is a positive relationship between the ratio of non-executive directors on the board and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H3a	There is a positive relationship between the overall level of compensation and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H4a	There is a positive relationship between directors' share ownership and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H5a	There is a negative relationship between extra board committees and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H6a	There is a positive relationship between internal controls and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H7a	There is a negative relationship between leverage and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
H8a	There is a negative relationship between the level of non-compliance with the UK corporate governance code and firm performance (as measured by Tobin's Q, TSR, ROE, and ROA) in the pre-2007 and post-2007 periods.
Survival related Hypotheses	
H1b	There is a negative relationship between board size and firm survival during the financial crisis.
H2b	There is a positive relationship between the ratio of non-executive directors and firm survival during the financial crisis.
H3b	There is a positive relationship between the overall level of compensation and firm survival during the financial crisis.
H4b	There is a negative relationship between directors' share ownership and firm survival during the financial crisis.
H5b	There is a positive relationship between extra board committees and firm survival during the financial crisis.
H6b	There is a positive relationship between internal controls and firm survival during the financial crisis.
H7b	There is a negative relationship between leverage and firm survival during the financial crisis.
H8b	There is a negative relationship between non-compliance with the UK corporate governance code and firm survival during the financial crisis.

Chapter 4 Analysis and results

4.1 Introduction

This chapter presents the empirical findings of the study and an analysis of the results. The chapter aims to achieve four main objectives. First, it investigates the impact of non-compliance with the UK corporate governance code on the performance of firms in two different time periods (i.e. before and during the financial crisis). Second, it investigates the impact of non-compliance with the UK corporate governance code on the survival of firms during the financial crisis. Third, the chapter provides evidence on the link between individual corporate governance mechanisms (such as, board size, board independence, remuneration etc.) and the performance of firms in two different time periods (i.e. before and during the financial crisis). Finally, it examines the association between internal corporate governance mechanisms (such as, board size, board independence, remuneration etc.) and the survival of firms during the financial crisis. The chapter also analyses the three year lagged effect of governance variables on the performance of firms. In addition, as a form of sensitivity analysis the chapter also presents the regression results for the whole sample of data.

To achieve these objectives, the hypotheses were presented in Chapter 2. These hypotheses are tested using a sample of 274 FTSE 350 listed firms over the period 2003–2010. The sample includes both financial and non-financial firms, both of which are analysed separately. Furthermore, to take into account the impact of the financial crisis on the relationship between internal corporate governance and the performance of firms, data analysis is carried out for three periods. First, the data is analysed for the whole sample period (2003–2010). Second, data is analysed for the pre-crisis period (2003–2006). Finally, data is analysed for the period 2007–2010, this being the period since the start of

the financial crisis in 2007. All of the hypotheses and the empirical results of the study are summarised in Table 4.18, Table 4.19 and Table 4.21.

In order to test the robustness of the results, four different proxies (i.e. Tobin's Q, ROA, ROE, and TSR) are used to measure the performance of firms. Furthermore, the data is analysed separately for financial and non-financial firms. In addition to this, the data is analysed over three different time periods (i.e. 2003–2010, 2003–2006, and 2007–2010).

The remainder of the chapter is structured as follows. Section 4.2 presents the descriptive statistics and Section 4.3 discusses the correlations. Section 4.4 reports the regression results for financial and non-financial firms separately, whilst Section 4.5 provides a summary of the chapter.

4.2 Descriptive Statistics

Table 4.1 provides the descriptive statistics for all of the variables included in the study for the whole sample. Table 4.2 provides the descriptive statistics for non-financial firms included in the sample, while Table 4.3 provides the descriptive statistics for financial firms. The non-compliance index (as explained in Section 3.3.2.1) is the main explanatory variable of the study and represents the level of non-compliance with Section 1 of the UK corporate governance code. The range of non-compliance by the sample companies varies between the minimum value of 0, which represents full compliance, to the maximum value of 16 (i.e. non-compliance with 16 provisions out of 22 provision included in the study). The results also show that, on average, the firms did not comply with 2.68 provisions during the period analysed (Table 4.1).

These values for non-compliance index are higher than those values reported by Shabbir and Padgett (2008). Shabbir and Padgett (2008) report a mean non-compliance of 1.58, and a maximum value of 8. These differences could be the result of a number of factors. Firstly, the sample period of the two studies is different i.e. Shabbir and Padgett (2008) study 122 non-financial firms listed on FTSE350 for the period 2000–2003, while this study's sample is for the period 2003–2010. Secondly, their study is based on the 1998 version of the UK corporate governance code. This code has been revised in 2003 and stricter provisions are now included in the new code.

For example, Section A.3.2 of the 2003 code requires that at least half the board, excluding the chairman, should comprise non-executive directors determined by the board to be independent. In the 1998 version of the code, there was no such requirement and companies were only required to have a balance of executive and non-executive directors on board. This additional provision could have caused the increase in the mean value of the

non-compliance index. Table 4.6 shows that Provision P4 (which is related to the number of NEDs on board) is one of the provisions with which a higher percentage of firms have not complied over the sample period.

Thirdly, Shabbir and Padgett (2008) exclude financial firms from their sample while financial firms are included in this study. Table 4.3 shows that the mean NCI for financial firms (3.57) is higher than the mean NCI for non-financial firms (2.28) which has caused an increase in the mean value of the NCI in this study.

Comparing the NCI index for financial and non-financial firms, Table 4.2 and Table 4.3 show that over the sample, period financial firms (mean NCI 3.57) were relatively more non-compliant with the UK corporate governance code than non-financial firms (mean NCI 2.28). Table 4.2 and Table 4.3 also show that over the sample period, non-financial firms performed better than financial firms as indicated by the relatively higher values for all of the performance measures (i.e. Tobin's Q, ROA, ROE, and TSR). Additionally, the average remuneration paid to directors for financial firms is slightly higher than the mean remuneration in the non-financial sector.

Table 4.1 Descriptive Statistics for the whole sample

Variables	Observations	Mean	Std. Dev.	Min	Max
Tobin's Q	2146	1.63	1.04	-0.25	8.20
ROA (%)	2146	8.23	9.03	-39.80	48.01
ROE (%)	2146	5.71	8.12	-37.11	49.22
TSR (%)	2146	14.20	41.82	-128.09	298.69
NCI	2146	2.68	2.61	0.00	16.00
Board Size	2146	8.33	2.51	3.00	20.00
NED Ratio	2146	0.65	0.18	0.00	1.00
Remuneration (£Million)	2146	2.78	2.57	0.04	27.53
Board Ownership (%)	2146	3.71	9.90	0.00	90.50
Leverage (%)	2146	24.12	20.66	0.00	136.91
Beta	2146	1.13	0.65	0.00	6.27
Extra committees	2146	1.27	1.29	0.00	8.00
Internal Controls	2146	9.59	2.75	0.00	15.00
Sales (£Million)	2146	4.77	16.51	0.00	247.29
Liquidity	2146	1.84	2.35	0.00	33.59
Capital (%)	2146	47.74	31.71	-42.05	177.20

Table 4.2 Descriptive statistics for non-financial firms

Variables	Observations	Mean	Std. Dev.	Min	Max
Tobin's Q	1467	1.90	1.11	-0.25	8.20
ROA (%)	1467	10.27	9.30	-39.80	48.01
ROE (%)	1467	7.20	8.30	-37.11	49.22
TSR (%)	1467	16.24	45.01	-128.09	298.69
NCI	1467	2.28	2.32	0.00	13.00
Board Size	1467	8.40	2.28	4.00	20.00
NED Ratio	1467	0.62	0.15	0.00	1.00
Remuneration (£Million)	1467	2.77	2.06	0.13	24.70
Board Ownership (%)	1467	4.30	11.37	0.00	90.50
Leverage (%)	1467	25.18	19.93	0.00	136.91
Beta	1467	1.15	0.71	0.00	6.27
Extra committees	1467	1.29	1.34	0.00	8.00
Internal Controls	1467	9.45	2.82	0.00	15.00
Sales (£Million)	1467	5.15	18.38	0.00	247.29
Liquidity	1467	1.58	1.16	0.00	13.97
Capital (%)	1467	43.05	26.03	-42.05	177.20

Table 4.3 Descriptive statistics for financial firms

Variables	Observations	Mean	Std. Dev.	Min	Max
Tobin's Q	679	1.06	0.51	0.13	6.88
ROA (%)	679	3.81	6.53	-36.52	26.35
ROE (%)	679	2.50	6.66	-36.10	32.50
TSR (%)	679	9.80	33.54	-94.96	181.37
NCI	679	3.57	2.96	0.00	16.00
Board Size	679	8.18	2.95	3.00	20.00
NED Ratio	679	0.72	0.21	0.14	1.00
Remuneration (£Million)	679	2.80	3.41	0.04	27.53
Board Ownership (%)	679	2.43	5.34	0.00	54.71
Leverage (%)	679	21.85	22.00	0.00	130.21
Beta	679	1.06	0.48	0.05	3.37
Extra committees	679	1.24	1.16	0.00	5.00
Internal Controls	679	9.88	2.57	0.00	14.00
Sales (£Million)	679	3.97	11.53	0.00	74.30
Liquidity	679	2.40	3.76	0.00	33.59
Capital (%)	679	57.86	39.57	-41.83	174.01

Table 4.4 provides details of each provision included in the construction of the non-compliance index. Table 4.6 outlines the percentage of firms not in compliance with each provision for the period 2003–2010. Furthermore, Table 4.6 shows that the level of non-compliance with each provision has decreased year on year for the sample firms during the period 2003–2010, with the exception of P4. Table 4.6 shows that non-compliance with provision P4, which is related to the presence of NEDs on board, has increased. In 2003, 12% of firms did not comply with this provision, whereas in 2010, 29% firms did not comply with this provision.

Table 4.6 shows that all of the sample firms complied with P12, P16, and P17 throughout the period. Similarly, a higher percentage of sample firms did not comply with provisions P2, P3, P4, P8, P15, and P18. Analysing Table 4.6, it is evident that all of these provisions (P2, P3, P4, P8, P15, and P18) are related to the independence of NEDs. Therefore, these higher percentages of non-compliant firms throughout the sample period indicate that firms either find it difficult to comply with the directors' independence

requirement of the UK corporate governance code, or firms do not consider compliance with these provisions to be an important factor.

Another explanation for the increased non-compliance with the provisions related to the independence of NEDs could be that companies find it difficult to recruit NEDs because, as reported in a Financial Times article, NEDs may be in short supply²¹.

Table 4.4 Provisions included in the Non-Compliance Index (NCI)

P1	Principle A.2 of the code states that there should be a clear division of responsibilities at the head of the company between the running of the board and the executive responsibility for the running of the company's business. No one individual should have unfettered powers of decision.
P2	Principle A.2.2 of the code states that the chairman should, on appointment, meet the independence criteria set out in Section A.3.1 of the UK corporate governance code.
P3	Principle A.3.3 states that the board should appoint one of the independent non-executive directors to be the senior independent director.
P4	Principle A.3.2 states that except for smaller companies ²² at least half of the board excluding the chairman should be Independent non-executive directors (INEDs).
P5	Principle A.3.2 states that the majority of non-executive directors (NEDs) should be Independent.
P6	Principles A.4.1, C.3.1, and B.2.1 state that the board should establish nomination, audit and remuneration committees.
P7	Principle A.4.6 states that a separate section of the annual report should describe the work of the nomination committee, including the process it has used in relation to board appointments.
P8	Principles A.4.1, C.3.1, and B.2 state that the audit, nomination, and remuneration committees should be headed by independent non-executive directors (INEDS).
P9	Principle A.4.5 states that executive directors should not take more than one non-executive directorship in a FTSE 100 company nor the chairmanship of such a company.
P10	Principle A.6.1 states that the board should report in the annual report how performance evaluation of the board, its committees and its individual directors has been conducted.
P11	Principle A.6.1 states that independent non-executive directors led by a senior independent director should be responsible for the performance evaluation of

²¹ <http://www.ft.com/cms/s/0/11e6aefa-0835-11de-8a33-0000779fd2ac.html#axzz25bkwXMgH> (Accessed on 5/09/2012).

²² A smaller company is one that is outside the FTSE 350 throughout the year immediately prior to the reporting year.

	the chairman, taking into account the views of executive directors.
P12	Principle A.7.1 states that all directors should be subject to election at their first AGM, and re-election every three years.
P13	Principle B.1.1 states that performance-related elements of remuneration should form a significant proportion of the total remuneration package of executive directors and should be designed to align their interests with those of shareholders and to give these directors keen incentives to perform at the highest levels.
P14	Principle B.1.2 states that remuneration for NEDs should not include share options.
P15	Principle B.2.1 states that the remuneration committee should be entirely composed of independent non-executive directors.
P16	Principle C.2 states that the board should maintain a sound system of internal controls to safeguard shareholders' investments and the company's assets.
P17	Principle C.2.1 states that the board should, at least annually, conduct a review of the effectiveness of the company's system of internal controls and should report to shareholders that they have done so.
P18	Principle C.3.1 states that at least three members of the audit committee should be independent non-executive directors.
P19	Principle C.3.1 states that the board should satisfy itself that at least one member of the audit committee has recent and relevant financial experience.
P20	Principle D.1.2 states that the board should report in the annual report the steps taken to ensure that board, including the NEDs, develops an understanding of the views of major shareholders of the company.
P21	Principle B.1.6 states that notice or contract periods should be set at one year or less.
P22	Principle C.3.2 states that the main role and responsibilities of the audit committee should be set out in written terms of reference.

Table 4.5 shows that the percentage of firms with full compliance (i.e. non-compliance score of 0) has decreased in the first four years i.e. 2003–2006 from 26.4% to 21.8%. However, since 2007 this percentage has increased year by year to 39.8% in 2010. This shows that since 2007 a greater number of firms have become compliant with the UK corporate governance code. This increase in compliance coincides with the revision of the code in 2006 by the Financial Reporting Council (FRC) and also with the recent financial crisis. Therefore, it could be argued that since the beginning of the financial crisis, FTSE firms have placed more importance on complying with the UK corporate governance code.

However, this increase in compliance could also be linked to the changes made by FRC to some of the provisions in the revised code, which have made it easier for firms to comply with certain provisions. This applies, for example to the provisions related to the

chairman's membership of remuneration committee, which affects compliance with provisions P8 and P15. Before 2006, the chairman could not be a member or chair of the remuneration committee, but since 2007 the combined code has relaxed this provision and allowed for chairmen to be members or chairs of the remuneration committee. Looking at the non-compliance with provisions P8 and P15, in Table 4.6, it is evident that non-compliance with each of these provisions has decreased since 2007. This means that effectively companies are maintaining their practices, but the revision of the code has turned non-compliance into compliance.

**Table 4.5 Level of compliance with the UK corporate governance code for the period
2003-2010**

Non-Compliance Score		Year							
		2003	2004	2005	2006	2007	2008	2009	2010
0	% of Total firms	26.4%	20.4%	16.9%	21.8%	29.1%	31.6%	38.1%	39.8%
1	% of Total firms	13.0%	11.3%	13.4%	16.5%	12.6%	12.0%	11.5%	12.9%
2	% of Total firms	15.8%	14.4%	16.5%	14.4%	17.3%	16.4%	13.7%	12.5%
3	% of Total firms	12.0%	16.5%	15.1%	13.4%	13.3%	13.1%	12.2%	12.1%
4	% of Total firms	11.3%	11.6%	10.2%	11.3%	9.4%	9.5%	7.4%	6.1%
5	% of Total firms	8.5%	8.1%	7.4%	6.3%	3.6%	5.5%	3.7%	3.4%
6	% of Total firms	5.6%	7.7%	7.7%	4.2%	4.0%	2.9%	4.4%	4.2%
7	% of Total firms	5.3%	5.6%	5.3%	5.3%	5.0%	4.0%	3.7%	3.8%
8	% of Total firms	1.1%	1.4%	4.2%	3.5%	2.9%	2.5%	2.6%	2.7%
9	% of Total firms	.7%	1.4%	1.8%	1.8%	1.8%	1.1%	1.1%	1.1%
10	% of Total firms	.0%	.0%	.7%	1.1%	.7%	1.1%	1.1%	1.1%
11	% of Total firms	.4%	.7%	.4%	.0%	.0%	.0%	.0%	.0%
12	% of Total firms	.0%	.4%	.0%	.0%	.0%	.0%	.0%	.0%
13	% of Total firms	.0%	.4%	.0%	.0%	.0%	.0%	.0%	.0%
16	% of Total firms	.0%	.0%	.4%	.4%	.4%	.4%	.4%	.4%
Total firms in each Year		274	274	274	274	268	268	268	264

Table 4.6 Percentage of non-compliant firms (whole sample i.e. N= 274) with each provision throughout the period (2003–2010)

Period	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22
2003	5	38	28	12	11	14	6	39	1	5	8	0	1	0	36	0	0	31	4	0	16	0
2004	6	45	23	28	13	11	5	43	2	9	20	0	1	1	40	0	0	32	10	0	11	1
2005	6	46	19	38	13	10	4	41	2	14	28	0	1	2	38	0	0	33	17	0	6	1
2006	5	49	18	35	12	9	2	39	2	8	22	0	1	1	34	0	0	28	15	1	6	0
2007	4	45	17	32	11	9	2	38	1	4	18	0	1	1	30	0	0	24	13	0	4	0
2008	3	44	15	32	11	9	2	38	1	3	15	0	1	1	30	0	0	24	12	0	2	0
2009	3	41	14	30	11	9	2	33	1	3	14	0	1	1	27	0	0	23	11	0	1	0
2010	3	39	13	29	11	9	2	31	1	2	14	0	1	1	24	0	0	22	11	0	2	0

Table 4.7 and Table 4.8 provide the mean values of the corporate governance variables for non- financial firms and financial firms respectively. Table 4.7 shows that the board size of FTSE350 non-financial companies has not changed much over the sample period and on average there are 8 members on the board for the sample firms. However, comparing this with the financial sector, Table 4.8 shows that the mean board size decreased after 2008 for financial firms. This indicates greater board restructuring in the financial sector after the onset of the financial crises.

Table 4.7 and Table 4.8 also show that, as earlier indicated by the NED ratios, firms in the financial sector have more independent boards (i.e. there is a higher number of NEDs on boards of financial firms). These values have remained relatively stable over the sample period. Similarly, the percentage of shares held by the board of directors in the non-financial sector is higher than the financial sector.

As far as directors' remuneration is concerned, Tables 4.8 shows that the average remuneration of a board of directors in the non-financial sector increased by 30% during the period 2003–2010. In the financial sector, the increase in directors' remuneration over the same time period is only 6.8%. Moreover, these tables show that directors' remuneration in the financial sector has decreased since 2008, whereas the remuneration levels in the non-financial sectors have actually increased between 2008 and 2010.

Table 4.9 and Table 4.10 show the mean values of all the performance measures for non-financial and financial sectors respectively. As one would expect, as a consequence of the financial crisis the TSR is negative both for non-financial and financial firms in 2007–2008. However, TSR has recovered faster in the non-financial sector than the financial sector after 2008. Similarly, Table 4.10 shows that ROE is negative for financial firms in 2008–2009, although Table 4.9 shows that ROE is positive for non-financial firms

throughout the period 2003–2010. This indicates that non-financial firms generally performed better than financial firms, after the onset of the financial crisis in 2007.

Table 4.7 Mean values for other corporate governance variables for each year (non-financial firms)

Year	Size	Nedratio	Boardown (%)	Remun (£million)	Extcmmtt	Intctlm
2003	8.56	0.60	4.17	2.63	1.09	8.66
2004	8.59	0.58	4.20	2.50	1.18	9.12
2005	8.41	0.60	4.35	2.20	1.26	9.49
2006	8.50	0.60	4.70	2.62	1.27	9.62
2007	8.29	0.62	4.40	2.74	1.33	9.63
2008	8.42	0.63	4.37	3.15	1.37	9.67
2009	8.22	0.66	4.34	2.96	1.40	9.75
2010	8.20	0.64	3.82	3.42	1.41	9.69
Total	8.40	0.62	4.30	2.77	1.29	9.45

Table 4.8 Mean values for other corporate governance variables for each year (financial firms)

Year	Size	Nedratio	Boardown (%)	Remun (£million)	Extcmmtt	Intctlm
2003	8.53	0.61	2.19	2.61	1.09	9.64
2004	8.29	0.70	2.68	2.28	1.19	9.66
2005	8.17	0.68	2.70	2.19	1.26	10.01
2006	8.45	0.75	2.62	2.84	1.24	10.00
2007	8.19	0.75	3.02	3.57	1.28	10.01
2008	8.15	0.76	2.23	3.46	1.34	9.98
2009	7.89	0.71	1.75	2.62	1.27	9.89
2010	7.70	0.78	2.24	2.79	1.27	9.83
Total	8.18	0.72	2.43	2.80	1.24	9.88

Table 4.9 Mean values of dependent variables for each year (non-financial firms)

Year	Tobin's Q	TSR (%)	ROA (%)	ROE (%)
2003	1.71	36.05	8.57	4.95
2004	1.86	17.85	9.00	6.51
2005	2.02	25.70	10.51	8.06
2006	2.16	19.77	11.23	8.56
2007	2.24	-1.37	12.75	9.30
2008	1.76	-38.94	12.78	7.52
2009	1.57	50.34	9.20	4.96
2010	1.86	19.99	8.06	7.76
Total	1.90	16.24	10.27	7.20

Table 4.10 Mean values of dependent variables for each year (financial firms)

Year	Tobin's Q	TSR (%)	ROA (%)	ROE (%)
2003	1.02	25.06	4.25	2.51
2004	0.98	15.50	3.84	2.46
2005	1.13	25.16	4.11	3.09
2006	1.11	18.95	5.65	5.42
2007	1.08	-11.41	6.27	4.50
2008	1.10	-38.63	5.01	-0.35
2009	1.02	31.33	0.75	-1.29
2010	1.01	12.81	0.33	3.50
Total	1.06	9.80	3.81	2.50

4.3 Correlations

Table 4.11 reports the correlation matrix for all of the independent variables included in the study. Table 4.11 is used to analyse whether high collinearity exists between any of the independent variables. The highest correlation is between remuneration and board size (0.53) and the second highest is between capital and leverage (0.40). However, high collinearity could be an issue only if the correlation between two variables is more than 0.80 (Field, 2009). Therefore, in this case, high collinearity does not seem to be a problem, and all independent variables can be entered into the regression model



simultaneously. In the following section, the results from the regression analysis are reported.

Table 4.11 correlations between independent variables

		1	2	3	4	5	6	7	8	9	10	11	12
1	Beta	1											
2	NCI	-.071**	1										
3	Extcmmtt	.001	-.241**	1									
4	Intctlm	.066**	-.047*	.328**	1								
5	Capital	-.014	.377**	-.221**	-.092**	1							
6	Liquidity	.077**	.131**	-.092**	.017	.243**	1						
7	Leverage	-.122**	-.178**	.077**	.003	-.402**	-.139**	1					
8	SIZE	-.025	-.173**	.318**	.192**	-.312**	-.146**	.110**	1				
9	NED Ratio	.011	.095**	-.007	-.021	.205**	.093**	-.061**	-.188**	1			
10	Boardown	.092**	.182**	-.057**	.020	.003	.021	-.041*	.026	-.082**	1		
11	Remun	-.018	-.164**	.227**	.150**	-.252**	-.134**	.097**	.530**	-.270**	.000	1	
12	Sales	-.024	-.154**	.211**	.092**	-.134**	-.066**	-.023	.358**	.012	-.075**	.352**	1

** . Correlation is significant at the 0.01 level (1-tailed). * . Correlation is significant at the 0.05 level (1-tailed).

4.4 Regression results

As discussed earlier, the two main approaches to the fitting of models using panel data/longitudinal data are known as fixed effects regression and random effects regression (Dougherty, 2007). In fixed effects model, it is assumed that the constant α (firm specific effects) differ between firms and are time invariant. In random effects model the constant α is a random outcome variable which has a cross section specific error component and is uncorrelated with the errors of the regressor variables (Wooldridge, 2002).

The Hausman specification test is widely used to determine the suitability of the fixed effects model or the random effects model for a given data set. If the Hausman test is significant, this means that fixed effects are preferred over random effects, and if it is not significant then random effects are preferred. Therefore, the Hausman test was used for each model in this study to decide between random and fixed effects models.

4.4.1 Corporate governance and performance for non-financial firms

As discussed earlier, financial and non-financial firms are analysed separately. This section outlines the results for the relationship between internal corporate governance mechanisms and the performance of non-financial firms. Section 4.4.1.1 presents the results when the data is analysed for the whole sample period 2003–2010. Section 4.4.1.2 outlines the results when the data is analysed for the pre-crisis period (2003–2006) whilst Section 4.4.1.3 shows the results when the data is analysed for the crisis period (2007–2010).

4.4.1.1 Corporate governance and the performance of non-financial firms for the sample period 2003–2010

Table 4.12 provides regression results for the relationship between various corporate governance variables and the four measures of firm performance. These results show the relationship between independent and dependent variables when the data is analysed for the whole sample period i.e. 2003–2010.

The Hausman test was run to decide whether a fixed effects or random effects regression model should be used. The Hausman test results are for Model 1, $\chi^2 = 64.18$ ($p=0.000$), Model 2 $\chi^2 = 29.76$ ($p=0.000$), Model 3 $\chi^2 = 22.24$ ($p=0.0517$), and Model 4 $\chi^2 = 11.29$ ($p=0.5862$). This shows that the Hausman test is significant in models using Tobin's Q (Model 1), TSR (Model 2), and ROA (Model 3). Hence, fixed effects

regressions are used. In the case of ROE (Model 4) the Hausman test is not significant, hence the random effects regression is used.

Table 4.12 Regression results for corporate governance and the performance of non-financial firms for the sample period 2003–2010

Independent Variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	-0.00148 (0.00501)	2.180* (1.310)	0.137 (0.195)	0.217 (0.160)
Board size	-0.00527 (0.00367)	0.528 (0.960)	-0.0541 (0.143)	-0.104 (0.113)
Board independence	-0.0717** (0.0363)	10.94 (9.500)	0.719 (1.411)	-0.948 (1.234)
Remuneration	-0.00553* (0.00322)	-0.875 (0.841)	-0.117 (0.125)	0.0264 (0.108)
Board ownership	0.00328*** (0.00105)	0.315 (0.275)	-0.0404 (0.0408)	0.0291 (0.0258)
Leverage	0.00149*** (0.000402)	-0.375*** (0.105)	0.0426*** (0.0156)	0.00110 (0.0123)
Beta	-0.0276** (0.0130)	9.251*** (3.387)	-1.595*** (0.503)	-1.682*** (0.414)
Extra committees	-0.0229** (0.0108)	-3.649 (2.818)	-1.265*** (0.419)	-0.0578 (0.247)
Internal controls	0.0374*** (0.00414)	-0.904 (1.082)	0.670*** (0.161)	0.387*** (0.103)
NCI*Beta	0.00125 (0.00376)	-2.264** (0.982)	-0.311** (0.146)	-0.312** (0.122)
Firm size	-0.00862 (0.0132)	-10.41*** (3.452)	1.783*** (0.513)	0.0221 (0.253)
Liquidity	-0.00492 (0.00669)	-2.217 (1.748)	0.461* (0.260)	-0.212 (0.209)
Capital	0.00177*** (0.000363)	-0.225** (0.0949)	0.0866*** (0.0141)	0.116*** (0.0105)
Constant	0.702*** (0.0603)	34.84** (15.77)	2.437 (2.342)	2.459 (1.732)
Observations	1,467	1,467	1,467	1,467
R-squared	0.126	0.036	0.109	*
Number of firms	188	188	188	188

Table 4.12 provides the results when the data is analysed for the whole sample period (i.e. 2003–2010). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of

internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p<0.01$, ** significance at $p<0.05$, * significance at $p<0.1$. Standard errors in parentheses. * R-squared not reported for model 4, because random effects regression is used.

Table 4.12 shows that the main explanatory variable the NCI is significantly and positively associated only with TSR. This relationship is statistically significant at 10% level and is quite strong when the coefficient for TSR (2.180) is compared with the other coefficients for Tobin's Q (0.00148), ROA (0.137) and ROE (0.217). However, this result does not support the hypothesis that non-compliance with the UK corporate governance code would lead to poor financial and operating performance. Instead, this result shows that non-compliant firms have higher TSR. This means that although the corporate governance mechanisms of non-compliant firms are not in compliance with the recommended code of best practice, but are consistent with value maximisation. This finding supports the view that companies adopt corporate governance mechanisms based on their organisational needs (Demsetz and Villalonga, 2001, Boone et al., 2007, Coles et al., 2008, McKnight and Weir, 2009, Coles et al., 2012).

Furthermore, this finding indicates that non-compliance with the UK corporate governance code does not necessarily mean that the corporate governance mechanisms of non-compliant firms are weak. Instead, it supports the view that board size, board composition and other corporate governance mechanisms of firms are determined by the specific business needs and information environment in which the firm operates (Gillan et al., 2004, Demsetz and Lehn, 1985, Raheja, 2005, Harris and Raviv, 2008, Bhagat et al., 2008, Daines et al., 2010). Therefore, firms can achieve better performance even if they are non-compliant with the recommended corporate governance codes.

This could indicate the benefits of the comply or explain approach of corporate governance system. These results show that the expectation that every company should comply with every provision (as required in the rules-based system such as Sarbanes-

Oxley Act 2002 in the USA) is not necessary and companies should be provided the flexibility to provide explanations for their non-compliance. The UK corporate governance code provides this flexibility.

Similarly, this result is consistent with some recent evidence on the link between internal corporate governance and performance in the financial sector. For example, Pathan and Skully (2010) argue that boards are endogenously chosen i.e. banks structure their boards consistently with the costs and benefits associated with the board's monitoring and advising functions, so if external restrictions are imposed on them it could lead to value destruction. Moreover, they also argue that board size is affected by the size and the nature of the activities of a firm (i.e. scope of operations).

The findings of Pathan and Skully (2010) indicate that board size is affected by the size and scope of an organisation. This could indicate that like board size, any other internal corporate governance mechanisms such as the composition of the board, the composition of board committees and remuneration could also be affected by the size and scope of a firm. The NCI in this study captures a firm's compliance with the recommendations of the UK corporate governance code in relation to board composition and other internal corporate governance variables. This means that the level of non-compliance with the UK corporate governance code could be affected by the size and scope of a firm.

Therefore, this result could indicate that although the non-compliant firms deviate from the recommendations of the UK corporate governance code, but they put in place corporate governance mechanisms which meet their organisational needs and which lead to shareholder value maximisation. Furthermore, Table 4.12 shows that the NCI is positively associated with ROA and ROE which supports the above argument. However, this association is not statistically significant.

Another explanation for the unexpected relationship between the NCI and the performance of firms could be the composition of the NCI. The NCI is composed of 22 inter related individual corporate governance provisions. Therefore, there is a possibility that the NCI impact is affected by the individual corporate governance variables cancelling each other out in the index. However, a principal component analysis carried out on the NCI, although the full results are not reported in this study. In this analysis, the 22 provisions used in the NCI were divided into six factors. Each of these factors was then entered into the regression models, but the results did not change when compared with using the aggregate NCI.

Table 4.12 also shows that board ownership, board independence and remuneration are associated only with Tobin's Q and the relationship of these internal corporate governance mechanisms with any of the other dependent variables is not significant. The positive relationship between board ownership and Tobin's Q supports the hypothesis that higher management ownership increases firm value. This result is consistent with existing evidence on the relationship between board ownership and firm performance (Florackis, 2005).

However, the result that board independence and remuneration negatively affect Tobin's Q, does not support the hypotheses that board independence and remuneration are positively associated with firm performance. The finding related to the negative relationship between board independence is though, consistent with some of the existing literature (e.g. Agrawal and Knoeber, 1996, Coles et al., 2008, McKnight and Weir, 2009, Pathan, 2009, Erkens et al., 2012, Aebi et al., 2012, Beltratti and Stulz, 2012, Adams, 2012). Many studies have offered an explanation for the negative relationship between board independence and firm performance. Choi and Hasan (2005) argue that the managerial hegemony theory i.e. where the non-executive directors' dependency on top

management, explains the negative relationship between the number of non-executive directors on a board and firm performance. It is also argued that lack of adequate knowledge and information about the firm's business may also be responsible for this negative relationship (Vafeas and Theodorou, 1998, Adams, 2012). Simply increasing the number of NEDs may therefore not be sufficient for performance improvement.

Explaining the negative relationship between board independence and performance, Beltratti and Stulz (2012) argue that during the financial crisis, banks choose shareholder friendly boards (i.e. boards with higher number of NEDs) as they were exposed to more risks due to their strategies. It was the risky strategies of the banks, rather than the good governance mechanisms, which have led to poor performance during the crisis. However, it can be argued that if the banks performed poorly due to excessive risk taking and not due to the higher number of NEDs, then this could indicate that NEDs have failed to do their job (i.e. to monitor and challenge excessive risk taking). Hence, increasing the number of NEDs on board will increase the costs (in terms of more directors' fees) without actually safeguarding the interests of shareholders. Therefore, increasing the representation of NEDs on boards could negatively affect firm performance.

Similarly, Adams (2012) reports that banks receiving bailout funds during the financial crisis had more independent boards. Adams (2012) argues that as the NEDs have less knowledge of the working of the company, they might not be able to provide strategic advice or monitor executive management when it is needed most. Using the same line of argument, Erkens et al. (2012) show that banks with more independent boards raised more equity capital during the financial crisis, because the NEDs encouraged management to issue more equity to avoid bankruptcy and survive the crisis period. However, raising equity capital during the crisis was very costly and it led to a wealth transfer from existing shareholders to debt holders, and therefore such firms experienced worse stock returns

during the crisis period. However, it can be argued that although this strategy of issuing more equity might have led to poor stock returns in the short run never the less, it helped such banks to survive the financial crisis. Therefore, in the long run the existence of more NEDs on boards could be beneficial for firms.

There is another explanation for the negative relationship between NEDs and the performance of firms. Lipton and Lorsch (1992) argue that personal costs to directors fall in large boards, which gives rise to 'free riding'. This argument could also be extended to the NEDs, as in the case of poor firm performance, it is the executive directors who are held responsible. Therefore, the personal cost to NEDs is very minimal when their firm is not performing well. This means that NEDs will lack motivation to monitor executive directors and protect the interests of shareholders. Hence, increasing the number of NEDs on board will lead to increased costs without having any positive impact on the performance of firms.

The negative relationship between remuneration and Tobin's Q found in this study contradicts the hypothesis that higher remuneration affects the performance of firms positively. Morck et al. (1988) and Denis et al. (2006) also report a negative relationship between remuneration and firm performance. They argue that higher remuneration could be the result of weak internal corporate governance mechanisms within a firm. Similarly, explaining the negative relationship between executive compensation and firm performance, Cheng et al. (2010) argue that firms with high executive remuneration experienced poor performance during the financial crisis.

Table 4.12 shows that the existence of extra board committees is significantly negatively associated with two measures of firm performance (i.e. Tobin's Q and ROA). Although this relationship is not statistically significant, the coefficient sign is negative for

TSR and ROE. As the coefficient sign is negative for all measures of performance, it indicates that having extra board committees leads to increased costs for firms and hence lowers performance. This finding is consistent with Core et al. (1999), Anderson et al. (2004), and John and Litov (2010). Similarly, McKnight and Weir (2009) study the impact of board nomination committees for a sample of UK listed firms and find that having a nomination committee increases the agency cost. In addition, Sun et al. (2009) study the impact of compensation committees, whilst Klein (1998) studies the impact of audit committees and both report the same findings. These committees are normally composed of NEDs. Therefore, these results bring into question the perceived positive impact of NEDs on performance and protecting the interests of shareholders.

Furthermore, Table 4.12 shows that the number of internal control mechanisms in place within an organisation is positively associated with Tobin's Q, ROA, and ROE. Therefore, as hypothesised, this shows that having strong internal control mechanisms could minimise the conflict of interest between agents and principals, thus leading to improved firm performance.

Some studies have shown that the corporate governance mechanisms of a firm could have an impact on its riskiness. Bae et al. (2012) argue that firm-level governance is negatively associated with risk as estimated by beta. To investigate this possibility, an interaction term between beta and the NCI is included in the model. Table 4.12 shows that this interaction term is significantly negatively associated with TSR, ROA, and ROE. This implies that although the NCI has no direct impact on firm performance, it does have an impact on firm performance when interacted with firms' riskiness (beta). This result indicates that firms with a high beta and a high level of non-compliance underperform. This finding supports results presented by Bae et al (2012) who argue that the performance

of poorly governed firms is more sensitive to changes in market conditions and that firms with weaker corporate governance suffer more when the market performs poorly.

In line with the existing literature, beta is included as a control variable so as to take into account the company specific risk of each firm (Welch, 2003, Beiner et al., 2006, Belkhir, 2009, Beltratti and Stulz, 2012). Table 4.12 shows that beta is negatively associated with Tobin's Q, ROA, and ROE, and supports some of the existing literature (Belkhir, 2009, Beltratti and Stulz, 2012). The negative relationship between beta and these performance measures is contrary to the economic relationship between risk and reward, i.e. high risk leads to high reward. This negative relationship could be explained by the type of performance measures used, as all of these performance measures (i.e. Tobin's Q, ROA, and ROE) are based on historical accounting numbers. However, beta is positively associated with TSR (TSR takes into account the dividend yields and capital gains). This positive relationship between beta and TSR supports the findings of (Beiner et al., 2006), who report that beta is positively associated with firm performance. Overall, these results indicate that, as reported in the existing literature, the relationship between beta and firm performance is mixed.

Table 4.12 also shows that leverage is significantly positively associated with two measures of performance i.e. Tobin's Q and ROA, hence supporting Jensen's (1986) view that debt could work as an effective internal corporate governance mechanism. This contradicts the hypothesis that leverage is negatively associated with the performance of firms. However, in line with most of the existing literature, such as Agrawal and Knoeber (1996), Short and Keasey (1999), Weir et al. (2002), and Adams (2012), leverage is significantly negatively associated with TSR. This supports the hypothesis that leverage negatively affects the performance of firms. This result also demonstrates that high

leveraged firms underperformed firms with low levels of leverage. Again, the results are mixed for the relationship between leverage and firm performance.

Table 4.12 shows that, as expected, the control variable capital is significantly positively associated with three measures of firm performance i.e. Tobin's Q, ROA, and ROE. However, capital is negatively associated with TSR. This shows that the relationship between capital and performance is different for different measures of firm performance. Liquidity, as expected, is positively associated with ROA. Furthermore, firm size is negatively associated with the market based measure of performance (TSR), but is positively associated with the accounting based measure (ROA) (Fama and French, 1992, Vafeas and Theodorou, 1998, Weir et al., 2002). However, its relationship with the other two measures is not significant.

4.4.1.2 Corporate governance and the performance of non-financial firms for the pre-crisis period

The Hausman test results for Model 1, $\chi^2 = 243.88$ ($p=0.000$), Model 2 $\chi^2 = 27.02$ ($p=0.0124$), Model 3 $\chi^2 = 37.95$ ($p=0.0000$), Model 4 $\chi^2 = 34.29$ ($p=0.000$). As the Hausman test is significant for all of the models in Table 4.13, fixed effects regressions are used.

Table 4.13 provides the regression results when the sample firms are analysed during the pre-crisis period (2003–2006). Table 4.13 shows that NCI, board size, board independence, remuneration and extra board committees do not affect any of the performance measures in the pre-crisis period. As far as the relationship between board size and firm performance in the pre-crisis period is concerned, it is not statistically significant. This was also the case when the data is analysed for the whole sample period.

However, the NCI is associated with TSR when the data is analysed for the whole sample period, but this relationship is not significant when the data is analysed over the period 2003–2006. Similarly, board independence, remuneration, and extra board committees are associated with firm performance in the 2003–2010 period, but these relationships are not statistically significant when the data is analysed for the period 2003–2006. Therefore, this implies that the relationship between firm performance and some corporate governance mechanisms changes according to the sample period.

Table 4.13 (Model 2) shows that the strength of the relationship (as indicated by the coefficients) between corporate governance mechanisms and firm performance is strong when TSR is used as a measure of firm performance. This indicates that the use of different measures of firm performance does affect the relationship between corporate governance and firm performance.

On the other hand, and as hypothesised, the results show that board ownership is significantly positively associated with the market based measures of performance, i.e. Tobin's Q and TSR, even when the data is analysed for 2003–2006. However, the relationship between board ownership and the accounting based measures of performance (ROA and ROE) is not significant. Leverage is associated with Tobin's Q in the pre-crisis period.

As reported in Table 4.12, the number of internal control mechanisms in place within a firm is positively associated with Tobin's Q, ROA, and ROE, but it is not statistically significantly associated with TSR. This result still holds when the data is analysed for the whole sample period (2003–2010). The interaction term for the NCI and beta is negatively associated only with ROA when the data is analysed for the period 2003–2006. Although its relationship with all other dependent variables is not statistically significant, the coefficient sign is negative.

As reported in Table 4.12 firm size is still positively associated with Tobin's Q and ROA, whilst it is negatively associated with TSR. The findings relating to Tobin's Q, ROA, and TSR are the same when data is analysed for the whole sample period 2003–2010. However, the relationship between ROE and firm size is not significant when the data is analysed for the period 2003–2006. Liquidity is positively associated with ROA for the whole sample period (i.e. 2003–2010), although this relationship is no longer statistically significant during the pre-crisis period (2003–2006).

As reported in Table 4.13, the relationship between capital and the three measures of performance i.e. Tobin's Q, ROA, and ROE is still positive and statistically significant for the period 2003–2006. However, TSR is not associated with capital when the data is analysed for the whole period (2003–2010). Furthermore, Beta is positively associated with Tobin's Q, ROA, and ROE during the period 2003–2006. The coefficient signs for these relationships are opposite to those revealed when the data is analysed for the whole period 2003–2010.

Table 4.13 Regression results for corporate governance and the performance of non-financial firms for the sample period 2003–2006

Independent variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	-0.000986 (0.00683)	1.779 (1.620)	0.0749 (0.249)	0.0830 (0.240)
Board size	5.54e-05 (0.00522)	0.119 (1.238)	-0.0514 (0.190)	0.0607 (0.184)
Board independence	-0.0135 (0.0435)	7.332 (10.32)	0.263 (1.586)	-0.407 (1.531)
Remuneration	-0.00854 (0.00528)	0.438 (1.252)	0.121 (0.192)	-0.0511 (0.186)
Board ownership	0.00468*** (0.00135)	0.756** (0.321)	-0.0108 (0.0494)	0.0489 (0.0477)
Leverage	0.00115** (0.000585)	0.109 (0.139)	0.00416 (0.0213)	-0.0201 (0.0206)
Beta	0.0435* (0.0242)	-6.704 (5.729)	2.024** (0.881)	1.457* (0.850)
Extra committees	-0.00939 (0.0185)	-4.257 (4.388)	-0.959 (0.675)	-0.425 (0.651)
Internal controls	0.0380*** (0.00497)	-0.548 (1.178)	0.379** (0.181)	0.349** (0.175)
NCI*Beta	-0.00340 (0.00505)	-1.906 (1.198)	-0.530*** (0.184)	-0.175 (0.178)
Firm size	0.0545** (0.0231)	-9.833* (5.467)	3.024*** (0.840)	1.296 (0.811)
Liquidity	0.0157 (0.00987)	-0.615 (2.340)	0.486 (0.360)	-0.100 (0.347)
Capital	0.00267*** (0.000569)	-0.0136 (0.135)	0.0993*** (0.0207)	0.103*** (0.0200)
Constant	0.477*** (0.0797)	33.35* (18.89)	1.287 (2.904)	-1.193 (2.803)
Observations	752	752	752	752
R-squared	0.249	0.037	0.114	0.093
Number of firms	188	188	188	188

Table 4.13 provides the results when the data is analysed for the pre-crisis period (i.e. 2003–2006). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

4.4.1.3 Corporate governance and the performance of non-financial firms for the crisis period

The Hausman test results for Model 1, $\chi^2 = 135.78$ ($\rho=0.000$), Model 2 $\chi^2 = 41.08$ ($\rho=0.0000$), Model 3 $\chi^2 = 23.61$ ($\rho=0.0000$), Model 4 $\chi^2 = 37.24$ ($\rho=0.000$). As the Hausman test is significant for all of the models in Table 4.14, fixed effects regressions are used.

Table 4.14 Regression results for corporate governance and the performance of non-financial firms for the sample period 2007–2010

Independent variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.00803 (0.0107)	-3.400 (3.704)	0.695 (0.452)	0.372 (0.383)
Board size	-0.00549 (0.00583)	0.0597 (2.015)	0.217 (0.246)	0.0175 (0.208)
Board independence	-0.137** (0.0583)	55.99*** (20.15)	1.439 (2.461)	-2.798 (2.082)
Remuneration	-0.00226 (0.00388)	-1.332 (1.342)	-0.266 (0.164)	0.0160 (0.139)
Board ownership	-0.00265 (0.00199)	-0.816 (0.689)	-0.174** (0.0841)	-0.0839 (0.0712)
Leverage	0.00191*** (0.000597)	-0.722*** (0.206)	0.0946*** (0.0252)	0.00903 (0.0213)
Beta	-0.0339* (0.0178)	33.31*** (6.166)	-2.054*** (0.753)	-0.509 (0.637)
Extra committees	-0.0392* (0.0216)	2.578 (7.478)	-1.641* (0.913)	0.0626 (0.773)
Internal controls	-0.0254 (0.0161)	1.924 (5.553)	-0.689 (0.678)	-0.377 (0.574)
NCI*Beta	-0.00233 (0.00667)	0.0791 (2.304)	-0.289 (0.281)	-0.268 (0.238)
Firm size	-0.134*** (0.0282)	14.63 (9.757)	1.981* (1.192)	0.115 (1.008)
Liquidity	0.00425 (0.00998)	-1.341 (3.449)	0.926** (0.421)	0.763** (0.356)
Capital	0.00145*** (0.000529)	-0.511*** (0.183)	0.0955*** (0.0224)	0.154*** (0.0189)
Constant	1.422*** (0.174)	-40.43 (59.98)	11.35 (7.326)	5.207 (6.197)
Observations	715	715	715	715
R-squared	0.134	0.167	0.161	0.151
Number of firms	182	182	182	182

Table 4.14 provides the results when the data is analysed for the crisis period (i.e. 2007–2010). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

Table 4.14 shows that NCI, board size, remuneration, internal controls, and NCI*Beta do not affect any of the performance measures used in the study when the sample firms are analysed during the crisis period (2007–2010). As is the case when the data is analysed for the whole sample period (2003–2010), board independence is significantly negatively associated with Tobin's Q. However, board independence is positively associated with TSR in the crisis period. This shows that the relationship between corporate governance mechanisms and the performance of firms is affected by the type of performance measures used as well as the time period of the study (Shabbir and Padgett, 2008).

This finding related to the negative relationship between board independence and firm performance does not support the hypothesis that board independence is positively associated with the performance of firms. However, as hypothesised, board independence is significantly positively associated with TSR during the crisis period (2007–2010) and supports the hypothesis that increasing the number of NEDs will positively affect firm performance.

Table 4.14 (Model 2) shows that the relationship between corporate governance and performance is strong when TSR is used as a measure of performance, thus indicating that TSR is a better proxy for measuring the performance of firms. Table 4.14 (Model 2) also shows that the coefficient is (55.99) during the crisis period. This coefficient is 7.33 when the data was analysed in the pre-crisis period (see Table 4.13 (Model 2)). This could indicate that as predicted by the resource dependence theory NEDs play a crucial role in connecting firms with critical resources during the financial crisis.

The relationship between board independence and the accounting based measures of performance is not significant; however, board independence is associated only with the market based measures of performance. This shows that having more NEDs on the board

sends a positive signal to investors (Rosenstein and Wyatt, 1990, 1997, Shivdasani and Yermack, 1999), but might not actually improve the operating performance of firms.

As reported earlier in Table 4.12 and Table 4.13, board ownership is positively associated with some measures of performance when the data is analysed for the whole sample period and pre-crisis period. However, board ownership is significantly negatively associated with ROA in the crisis period and its relationship with the other measures of performance is not significant. The negative impact of board ownership on firm performance does not support the hypothesised positive relationship. However, it supports the view that high levels of managerial ownership could lead to managerial entrenchment due to the fact that managers of such firms are more powerful. Indeed, they have enough control to enforce their views and find it more beneficial to consume perquisites (such as expensive offices, private jets and attractive salaries) than to maximise value (Morck et al., 1988, Short and Keasey, 1999).

The results show that there is a negative relationship between board ownership and performance only in the crisis period (2007–2010), which indicates that the higher managerial ownership might be beneficial for firm performance during normal economic times. However, the negative impact of higher managerial ownership, as highlighted by Morck et al. (1988) and Short and Keasey (1999) becomes more severe during difficult economic times (such as the financial crisis).

As hypothesised, leverage is negatively associated with TSR in the crisis period, but is positively associated with Tobin's Q and ROA during the crisis-period. Comparing these results for the relationship between leverage and performance across the three time periods i.e. 2003–2010, 2003–2006, and 2007–2010, it is evident that leverage is positively associated with Tobin's Q in all time periods, while it is negatively associated with TSR in

the periods 2003–2010 and 2007–2010. This shows that corporate governance impacts upon firm performance differently during different time periods.

The existence of extra board committees is negatively associated with two measures of performance, Tobin's Q and ROA. This could indicate the cost of extra committees for firms during difficult economic times. Again, this relationship is not statistically significant for the pre-crisis period, i.e. 2003–2006. However, the relationship between extra board committees and performance is negative in the crisis period (2007–2010) and when data is analysed for the whole period (2003–2010).

Table 4.14 shows that amongst the control variables capital is significantly positively associated with Tobin's Q, ROA and ROE. Capital is positively associated with performance across the three time periods. However, it is significantly negatively associated with TSR. As expected, liquidity is significantly positively associated with ROA and ROE in the crisis period, although its relationship with the market based measures of performance is not significant.

Furthermore, Table 4.14 shows that firm size is negatively associated with Tobin's Q, but positively associated with ROA in the crisis period. This finding is consistent with the existing literature, which predicts a negative relationship between firm size and market based measures of performance (Fama and French, 1992, Vafeas and Theodorou, 1998, Weir et al., 2002). In addition, and as expected, beta is significantly and negatively associated with Tobin's Q and ROA. However, beta is positively associated with TSR during the crisis period.

4.4.2 Corporate governance and the performance of financial firms

This section provides the regression results between internal corporate governance mechanisms and the performance of firms for financial firms included in the study. The results are based on a sample of 86 financial firms. Section 4.4.2.1 shows the results when these firms are analysed for the whole sample period. Section 4.4.2.2 outlines the results when these firms are analysed for the pre-crisis period (2003–2006), and Section 4.4.2.3 presents the results when the data is analysed for the period 2007–2010.

4.4.2.1 Corporate governance and the performance of financial firms for the sample period 2003–2010

The Hausman test results for Model 1, $\chi^2 = 42.64$ ($p=0.000$), Model 2 $\chi^2 = 61.48$ ($p=0.0000$), Model 3 $\chi^2 = 50.02$ ($p=0.0000$), Model 4 $\chi^2 = 68.06$ ($p=0.000$). As the Hausman test is significant for all of the models in Table 4.15, fixed effects regressions are used.

Table 4.15 shows the regression results for the relationship between corporate governance variables and the performance of financial firms for the period 2003–2010. It is evident from the table that NCI, board size, board ownership, leverage, extra board committees and NCI*Beta do not affect firm performance. However, board independence is significantly negatively associated with the three measures of performance – TSR, ROA, and ROE. As reported earlier, for non-financial firms this relationship is strong when TSR is used as a measure of performance.

Table 4.15 shows that the coefficient for TSR is -30.38, compared with ROA (-3.559), ROE (-3.536) and Tobin's Q (-0.0234). The negative relationship between board independence and performance does not support the hypothesised positive relationship. However, these findings are consistent with some recent studies on the relationship

between board independence and performance of financial firms (Pathan, 2009, Belkhir, 2009, Erkens et al., 2012, Aebi et al., 2012, Adams, 2012, Beltratti and Stulz, 2012). As is the case in the non-financial sector, remuneration is negatively associated with performance. Again this finding contradicts the stated hypothesis regarding the relationship between board independence and performance.

Table 4.15 shows that, similar to the non-financial sector, internal control mechanisms have a positive impact on the performance of firms, when performance is measured by Tobin's Q. Unlike non-financial firms, the relationship between internal controls and the other measures of performance is not significant for financial firms.

For the control variables used in the study, Table 4.15 shows that capital is positively associated with the performance of financial firms. Firm size is negatively associated with TSR, but positively associated with ROA and ROE. As is the case in the non-financial sector beta is negatively associated with Tobin's Q and ROA in the financial sector. The relationship between liquidity and firm performance is not significant.

Table 4.15 Regression results for corporate governance and the performance of financial firms for the sample period 2003–2010

Independent variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.00575 (0.00511)	0.718 (1.565)	0.287 (0.260)	0.276 (0.284)
Board size	0.00429 (0.00321)	-0.662 (0.985)	0.0110 (0.163)	0.131 (0.179)
Board independence	-0.0234 (0.0276)	-30.38*** (8.464)	-3.559** (1.405)	-3.536** (1.538)
Remuneration	-0.00187 (0.00187)	-1.649*** (0.572)	0.102 (0.0950)	-0.0385 (0.104)
Board ownership	-0.000241 (0.00123)	-0.262 (0.376)	0.00277 (0.0625)	0.0882 (0.0684)
Leverage	0.000613 (0.000550)	-0.0135 (0.168)	0.0190 (0.0279)	-0.00396 (0.0306)
Beta	-0.0294* (0.0152)	7.128 (4.651)	-3.828*** (0.772)	-0.584 (0.845)
Extra committees	-0.0133 (0.0107)	-4.416 (3.266)	0.339 (0.542)	-0.118 (0.593)
Internal controls	0.0457*** (0.00474)	0.824 (1.453)	-0.0474 (0.241)	-0.380 (0.264)
NCI*Beta	-0.00557 (0.00421)	0.327 (1.289)	-0.193 (0.214)	-0.153 (0.234)
Firm size	0.0112 (0.0105)	-14.24*** (3.204)	1.093** (0.532)	2.306*** (0.582)
Liquidity	-0.000111 (0.00134)	0.537 (0.410)	-0.00512 (0.0681)	0.00595 (0.0745)
Capital	-0.000424 (0.000295)	0.539*** (0.0904)	0.0969*** (0.0150)	0.171*** (0.0164)
Constant	0.316*** (0.0693)	-29.66 (21.24)	5.728 (3.525)	2.317 (3.858)
Observations	679	679	679	679
R-squared	0.178	0.155	0.171	0.193
Number of firms	86	86	86	86

Table 4.15 provides the results when the data is analysed for the whole sample period (i.e. 2003–2010). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

4.4.2.2 Corporate governance and the performance of financial firms for the pre-crisis period

The Hausman test results for Model 1, $\chi^2 = 107.98$ ($p=0.000$), Model 2 $\chi^2 = 23.13$ ($p=0.0402$), Model 3 $\chi^2 = 43.58$ ($p=0.0000$), Model 4 $\chi^2 = 55.41$ ($p=0.000$). As the Hausman test is significant for all of the models in Table 4.16, fixed effects regressions are used.

Table 4.16 provides the regression results when the data are analysed for financial firms for the pre-crisis period (i.e. 2003-2006). As hypothesised, the main explanatory variable of the study the NCI, is significantly negatively associated with the two accounting based measures of performance in the pre-crisis period (ROA and ROE).

Table 4.16 also shows that board size, remuneration, and extra board committees do not affect firm performance in the pre-crisis period. This finding is the same as for non-financial firms. The findings related to board size and extra committees on board are the same when the data is analysed for the period 2003–2010. However, the relationship between remuneration and performance is negative and significant when the data is analysed for 2003–2010, but this relationship is not significant for the pre-crisis period (2003–2006).

Table 4.16 shows that board independence is negatively associated with TSR in the pre-crisis period. Its relationship with the other measures of performance, i.e. Tobin's Q, ROA and ROE is not significant, although the coefficient sign is still negative. Based on the coefficients, Table 4.16 shows that the relationship is strong in the case of TSR (-14.26) as compared with the other measures Tobin's Q (-0.008), ROA (-1.002) and ROE (-1.420). This again indicates that TSR is a better proxy of firm performance. Board

independence is not associated with any of the performance measures in the case of non-financial firms in the same period.

The existence of internal control mechanisms is only positively associated with the market based measures of performance for financial firms in the pre-crisis period. It is interesting to note that this relationship for the same time period in the case of non-financial firms is different. In the case of non-financial firms, internal control mechanisms are positively associated only with the accounting based measures of performance. Therefore, this shows that the same type of internal corporate governance mechanisms could interact differently with firm performance for financial and non-financial firms (Adams and Mehran, 2003).

Table 4.16 shows that the relationship between the interaction term (NCI*Beta) and performance is significant and positive only for accounting based measures of performance (ROA, and ROE). This result for financial firms is different when compared with non-financial firms. In the case of non-financial firms, this relationship is significant only for ROA, but the coefficient sign is negative. Furthermore, the relationship between NCI*Beta and all other measures of performance is not significant when the data is analysed for the whole period (i.e. 2003–2010).

Table 4.16 shows that the relationship between beta and all measures of performance is not significant for financial firms in the pre-crisis period. This negative relationship between beta and performance for financial firms is in direct contrast with the relationship between beta and performance for the non-financial firms during the same time period. Similarly, when the data is analysed for the period 2003–2010 for non-financial firms, beta is negatively associated with Tobin's Q, ROA, and ROE.

As far as the other control variables of the study are concerned, Table 4.16 shows that the relationship between liquidity and all measures of performance is not significant. As is the case for non-financial firms, capital is significantly positively associated with TSR, ROA, and ROE for financial firms as well, thereby supporting the hypothesised positive impact of capital. Furthermore, firm size is only positively associated with the accounting based measures of performance (i.e. ROA and ROE). This finding contradicts, Fama and French (1992), Vafeas and Theodorou (1998), and Weir et al. (2002).

Table 4.16 Regression results for corporate governance and the performance of financial firms for the sample period 2003–2006

Independent variables	Model 1	Model 2	Model 3	Model 4
	Tobin's Q	TSR	ROA	ROE
NCI	0.00892 (0.00760)	-0.116 (1.507)	-0.541** (0.241)	-0.993*** (0.289)
Board size	0.00331 (0.00425)	-1.088 (0.844)	0.100 (0.135)	0.145 (0.162)
Board independence	-0.00837 (0.0323)	-14.26** (6.411)	-1.002 (1.025)	-1.420 (1.228)
Remuneration	-0.00183 (0.00314)	-0.385 (0.624)	0.0675 (0.0997)	0.00953 (0.119)
Board ownership	-9.99e-05 (0.00243)	-0.0320 (0.483)	0.107 (0.0772)	0.196** (0.0925)
Leverage	0.00141* (0.000785)	0.359** (0.156)	0.00821 (0.0249)	-0.0167 (0.0298)
Beta	-0.0549 (0.0480)	7.657 (9.528)	-1.228 (1.524)	-0.935 (1.825)
Extra committees	0.000158 (0.0171)	3.653 (3.397)	0.784 (0.543)	0.797 (0.651)
Internal controls	0.0666*** (0.00642)	2.997** (1.273)	0.0405 (0.204)	-0.133 (0.244)
NCI*Beta	-0.00576 (0.00871)	-1.018 (1.728)	0.565** (0.276)	0.954*** (0.331)
Firm size	0.0153 (0.0164)	-4.445 (3.262)	0.904* (0.522)	1.812*** (0.625)
Liquidity	0.00105 (0.00229)	0.258 (0.454)	0.0117 (0.0726)	0.0340 (0.0869)
Capital	0.000160 (0.000605)	0.347*** (0.120)	0.0786*** (0.0192)	0.106*** (0.0230)
Constant	0.0578 (0.112)	-34.28 (22.30)	0.653 (3.566)	1.817 (4.270)
Observations	344	344	344	344
R-squared	0.398	0.116	0.125	0.193
Number of firms	86	86	86	86

Table 4.16 provides the results when the data is analysed for the pre-crisis period (i.e. 2003–2006). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

4.4.2.3 Corporate governance and the performance of financial firms for the crisis period

The Hausman test results for Model 1, $\chi^2 = 26.08$ ($p=0.000$), Model 2 $\chi^2 = 28.75$ ($p=0.0000$), Model 3 $\chi^2 = 39.71$ ($p=0.0000$), Model 4 $\chi^2 = 45.49$ ($p=0.000$). As the Hausman test is significant for all of the models in Table 4.17, fixed effects regressions are used.

Table 4.17 provides the regression results for the relationship between corporate governance variables and the four measures of performance for the period 2007–2010 for financial firms. As Table 4.17 shows, the main explanatory variable of the study the NCI, is only significantly associated with the market based measures of performance (i.e. Tobin's Q and TSR). Having said this, the results are mixed, i.e. as hypothesised, the NCI is negatively associated with TSR, but, unexpectedly, is positively associated with Tobin's Q. The relationship between NCI and the two accounting based measures of performance is not statistically significant. However, the coefficient sign is unexpectedly positive.

As discussed earlier, the positive relationship between the NCI and Tobin's Q is consistent with some of the existing literature and shows that firms can perform better even when they are non-compliant with the recommended codes (Demsetz and Villalonga, 2001, Boone et al., 2007, Coles et al., 2008, McKnight and Weir, 2009, Coles et al., 2012). On the other hand, the negative relationship between the NCI and TSR does support the hypothesised negative relationship between non-compliance and firm performance. However, these mixed results do show that the relationship between internal corporate governance and performance depends on the type of performance measures used (Shabbir and Padgett, 2008).

The coefficients for the relationship between the NCI and TSR indicate that the negative impact of non-compliance with the UK corporate governance on the performance of firms is high during the crisis period when compared with the pre-crisis period. Table 4.17 (Model 2) shows that the coefficient is -8.923 during the crisis period. The coefficient in the pre-crisis period on the other hand is -0.116 (see Table 4.16). This could indicate that investors attach more importance to compliance during a financial crisis.

Table 4.17 also shows that board size, remuneration, board ownership, extra board committees, and internal control mechanisms are not associated with any of the performance measures. The findings relating to board size, remuneration, and internal control are the same as the findings for non-financial firms for the same time period.

Table 4.17 shows that board independence is significantly negatively associated with TSR, ROA, and ROE. This finding does not support the hypothesised positive relationship between board independence and performance. Again, this finding supports some recent studies (Pathan, 2009, Belkhir, 2009, Erkens et al., 2012, Aebi et al., 2012, Adams, 2012, Beltratti and Stulz, 2012). The coefficients for board independence and all measures of performance have increased substantially during the crisis period when compared with the pre-crisis period. Table 4.17 shows that the coefficients for TSR (-44.06), ROA (-10.75) and ROE (-6.821). On the other hand, Table 4.16 shows that the coefficients for board independence during the pre-crisis period are TSR (-14.26), ROA (-1.002) and ROE (-1.420). This could indicate that the negative impact of higher numbers of NED representation increases during a financial crisis.

In addition, the results reveal that leverage is negatively associated with TSR, thus supporting the hypothesis that leverage negatively affects firm performance. However, it is positively associated with Tobin's Q, which does not support the hypothesised negative association between leverage and performance. These findings are the same for financial

and non-financial firms over the same time period. For one of the control variables, as hypothesised, capital is positively associated with TSR, ROA, and ROE. Capital is, however, significantly negatively associated with Tobin's Q. For the other control variables, liquidity is not associated with any of the performance measures, whereas beta is positively associated with TSR but negatively associated with ROA.

Table 4.17 also shows that the findings related to the relationship between firm size and performance are mixed. Firm size is significantly negatively associated with TSR, but significantly positively associated with ROE. Furthermore, Table 4.17 shows that the findings related to NCI*Beta are also mixed: for TSR it is positive, while for ROA it is negative. This relationship is not significant for non-financial firms over the same time period.

Table 4.17 Regression results for corporate governance and the performance of financial firms for the sample period 2007–2010

Independent Variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.0215** (0.0105)	-8.923** (4.369)	1.215 (0.770)	0.956 (0.836)
Board size	-0.00604 (0.00525)	-1.843 (2.189)	-0.120 (0.386)	0.205 (0.419)
Board independence	-0.0223 (0.0447)	-44.06** (18.66)	-10.75*** (3.290)	-6.821* (3.570)
Remuneration	0.000687 (0.00245)	-1.628 (1.023)	0.114 (0.180)	0.0190 (0.196)
Board ownership	0.000175 (0.00144)	-0.319 (0.600)	-0.0636 (0.106)	0.0802 (0.115)
Leverage	0.00262*** (0.000871)	-0.689* (0.363)	0.00379 (0.0641)	-0.0245 (0.0695)
Beta	0.00180 (0.0189)	15.61** (7.888)	-3.692*** (1.391)	1.514 (1.509)
Extra committees	0.00899 (0.0212)	-6.947 (8.864)	0.142 (1.563)	1.258 (1.696)
Internal controls	-0.00955 (0.00849)	-1.062 (3.541)	0.338 (0.624)	-0.793 (0.677)
NCI*Beta	-0.00665 (0.00613)	4.255* (2.559)	-1.149** (0.451)	-0.774 (0.490)
Firm size	0.0231 (0.0206)	-20.10** (8.601)	0.186 (1.517)	5.835*** (1.645)
Liquidity	0.000278 (0.00203)	1.116 (0.848)	-0.0505 (0.150)	-0.0525 (0.162)
Capital	-0.00151*** (0.000360)	0.579*** (0.150)	0.0987*** (0.0265)	0.193*** (0.0288)
Constant	0.861*** (0.104)	14.02 (43.32)	7.425 (7.640)	8.448 (8.288)
Observations	335	335	335	335
R-squared	0.116	0.225	0.218	0.227
Number of firms	86	86	86	86

Table 4.17 provides the results when the data is analysed for the crisis period (i.e. 2006–2010). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

Table 4.18 Summary of empirical results for the market based measures of performance (Tobin's Q, TSR)

Dependent variable Tobin's Q		Non-financial firms						Financial firms					
Independent variables	Expected sign	Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)		Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
		Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*
H1a	-	Accepted	No	Rejected	No	Accepted	No	Rejected	No	Rejected	No	Accepted	No
H2a	+	Rejected	Yes	Rejected	No	Rejected	Yes	Rejected	No	Rejected	No	Rejected	No
H3a	+	Rejected	Yes	Rejected	No	Rejected	No	Rejected	No	Rejected	No	Accepted	No
H4a	+	Accepted	Yes	Accepted	Yes	Rejected	No	Rejected	No	Rejected	No	Accepted	No
H5a	-	Accepted	Yes	Accepted	No	Accepted	Yes	Accepted	No	Rejected	No	Rejected	No
H6a	+	Accepted	Yes	Accepted	Yes	Rejected	No	Accepted	Yes	Accepted	Yes	Rejected	No
H7a	-	Rejected	Yes	Rejected	Yes	Rejected	Yes	Rejected	No	Rejected	Yes	Rejected	Yes
H8a	-	Accepted	No	Accepted	No	Rejected	No	Rejected	No	Rejected	No	Rejected	Yes

Dependent variable TSR		Non-financial firms						Financial firms					
Independent variables	Expected sign	Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)		Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
		Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*
H1a	-	Rejected	No	Rejected	No	Rejected	No	Accepted	No	Accepted	No	Accepted	No
H2a	+	Accepted	No	Accepted	No	Accepted	Yes	Rejected	Yes	Rejected	Yes	Rejected	Yes
H3a	+	Rejected	No	Accepted	No	Rejected	No	Rejected	Yes	Rejected	No	Rejected	No
H4a	+	Accepted	No	Accepted	Yes	Rejected	No	Rejected	No	Rejected	No	Rejected	No
H5a	-	Accepted	No	Accepted	No	Rejected	No	Accepted	No	Rejected	No	Accepted	No
H6a	+	Rejected	No	Rejected	No	Accepted	No	Accepted	No	Accepted	Yes	Rejected	No
H7a	-	Accepted	Yes	Rejected	No	Accepted	Yes	Accepted	No	Rejected	Yes	Accepted	Yes
H8a	-	Rejected	Yes	Rejected	No	Accepted	No	Rejected	No	Accepted	No	Accepted	Yes

* This shows whether or not the result is statistically significant

Table 4.19 Summary of empirical results for the accounting based measures of performance (ROA, ROE)

Dependent variable ROA		Non-financial firms						Financial firms					
		Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)		Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
Independent variables		Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*
H1a	Board size		+	Accepted	No	Rejected	No	Rejected	No	Rejected	No	Accepted	No
H2a	Board independence		+	Rejected	No	Accepted	No	Rejected	Yes	Rejected	No	Rejected	Yes
H3a	Remuneration		+	Rejected	No	Rejected	No	Accepted	No	Accepted	No	Accepted	No
H4a	Board ownership		+	Rejected	No	Rejected	Yes	Accepted	No	Accepted	No	Rejected	No
H5a	Extra committees		-	Accepted	Yes	Accepted	Yes	Rejected	No	Accepted	No	Rejected	No
H6a	Internal controls		+	Accepted	Yes	Rejected	No	Rejected	No	Accepted	No	Accepted	No
H7a	Leverage		-	Rejected	Yes	Rejected	Yes	Rejected	No	Accepted	No	Rejected	No
H8a	NCI		-	Rejected	No	Rejected	No	Rejected	No	Accepted	Yes	Rejected	No

Dependent variable ROE		Non-financial firms						Financial firms					
		Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)		Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
Independent variables		Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*	Result	Sig*
H1a	Board size		-	Accepted	No	Rejected	No	Rejected	No	Rejected	No	Rejected	No
H2a	Board independence		+	Rejected	No	Rejected	No	Rejected	Yes	Rejected	No	Rejected	Yes
H3a	Remuneration		+	Accepted	No	Rejected	No	Rejected	No	Accepted	No	Accepted	No
H4a	Board ownership		+	Accepted	No	Rejected	No	Accepted	No	Accepted	Yes	Accepted	No
H5a	Extra committees		-	Accepted	No	Rejected	No	Rejected	No	Rejected	No	Rejected	No
H6a	Internal controls		+	Accepted	Yes	Rejected	Yes	Rejected	No	Accepted	No	Rejected	No
H7a	Leverage		-	Rejected	No	Rejected	No	Accepted	No	Accepted	No	Accepted	No
H8a	NCI		-	Rejected	No	Rejected	No	Rejected	No	Accepted	Yes	Rejected	No

* This shows whether or not the result is statistically significant

4.4.3 Corporate governance variables lagged for three years

As discussed in Chapter 3, the relationship between internal corporate governance mechanisms and the performance of firms may be affected by one form of endogeneity, which arises from reverse causation, i.e. a firm's corporate governance mechanism could be affected by its performance rather than governance affecting the performance. To take into account this form of endogeneity in line with the existing literature, three year lagged values of internal corporate governance mechanisms are regressed on performance (Hermalin and Weisbach, 1991, Himmelberg et al., 1999, Coles et al., 2008, McKnight and Weir, 2009). Section 4.4.3.1 outlines the results of the lagged governance variables and performance for non-financial firms. Section 4.4.3.1 presents the regression results between lagged governance variables and performance for financial firms.

Corporate governance and performance for three year lags of governance variables
(Non-financial firms)

The Hausman test results for each model in Appendix 1 are Model 1, $\chi^2 = 13.72$ ($p=0.000$), Model 2 $\chi^2 = 21.08$ ($p=0.1573$), Model 3 $\chi^2 = 33.41$ ($p=0.0000$), Model 4 $\chi^2 = 52.24$ ($p=0.000$). As the Hausman test is significant for all of the models except for Model 2, random effects regressions are used for Model 2 and fixed effects are used for all of the remaining models.

Appendix 1 provides the results for the relationship between all the measures of firm performance and the three year lags of corporate governance variables. The results suggest that the relationship between the main explanatory variable of the study the NCI and firm performance is not significant for any of the lags. As reported earlier (also refer to Appendix 1) board size is not associated with any of the performance measures in the

current period. However, when board size is lagged for three years, the results are somewhat mixed.

The results show that when board size is lagged for one year, its relationship is significant only with Tobin's Q. When it is lagged for two years, it is positively associated with ROA. Both these findings contradict the hypothesis that board size negatively affects performance. However, these findings are consistent with some recent research, which shows that board size is positively associated with performance (Aebi et al., 2012, Belkhir, 2009) . The existing literature outlines a number of reasons for the positive relationship between board size and firm performance. For example, board size is affected by the scope and nature of activities of an organisation. Therefore, for some firms, large boards could be more beneficial (Pathan and Skully, 2010). Similarly, Coles et al. (2008) argue that large boards increase firm value in complex firms. Furthermore, in the context of financial firms, large boards have been found to lead to better performance (Adams and Mehran, 2005, Andres and Vallelado, 2008).

On the other hand, the results do provide some evidence in support of the hypothesised negative relationship between board size and firm performance. As reported in Appendix 1, when board size is lagged for two years, it is negatively associated with TSR. Similarly, the three year lag is negatively associated with ROE. This indicates that board size may affect firm performance after a period of time. However, overall the results are inconclusive.

In support of the hypothesis that board independence positively affects performance, the results show that only TSR is positively associated with the contemporaneous values of board independence. However, Appendix 1 shows that for all the other measures of performance (i.e. Tobin's Q, ROA, and ROE), the contemporaneous

as well as lagged values of board independence are significantly negatively associated with firm performance.

Similarly, in the case of remuneration, only a one year lag is positively associated with TSR. All of the other lags and the contemporaneous values of remuneration are significantly negatively associated with the other measures of firm performance. Furthermore, Appendix 1 shows that the contemporaneous values of board ownership are significantly negatively associated with Tobin's Q and ROA, although this relationship is not statistically significant for all the lags.

Appendix 1 also shows that the relationship between internal control mechanisms and the performance of firms is not statistically significant for the contemporaneous values of internal control mechanisms. However, this relationship is statistically significant for three year lags of internal control mechanisms. This suggests that internal control mechanisms put in place will affect the performance of firms after a period of time.

Corporate governance and performance for three years lags of governance variables
(Financial firms)

The Hausman test results for each model in Appendix 2 are Model 1, $\chi^2 = 45.18$ ($p=0.2781$), Model 2 $\chi^2 = 91.38$ ($p=0.4108$), Model 3 $\chi^2 = 47.21$ ($p=0.0000$), Model 4 $\chi^2 = 63.27$ ($p=0.000$). As the Hausman test is not significant for Model 1 and Model 2, random effects are used. For Model 3 and Model 4, fixed effects are used.

Appendix 2 provides the relationship between firm performance and the corporate governance variables lagged for three years. Appendix 2 shows that the main explanatory variable of the study the NCI is associated with TSR and ROA when lagged for three years. However, the results are mixed. For TSR it is negative and supports the hypothesised negative impact of non-compliance, but for ROA it is positive and

contradicts the hypothesised link. In addition, the one year lag of NCI is positively associated with ROE. This result does show that when lagged values of NCI are used, these analyses produce some statistically significant results for the relationship between NCI and performance. Again, this indicates that internal corporate governance mechanisms within a firm will affect performance after a certain period of time.

Lagged values of board size are not associated with any of the performance measures. Appendix 2 shows that board independence is negatively associated with all measures of performance in the current year. However, for all the lags, this relationship is not statistically significant. Only the three year lag value of board independence is positively associated with TSR, thus supporting the hypothesised link. However, overall the results are mixed and inconclusive.

Appendix 2 shows that although remuneration does not affect any of the performance measures in the current year, when it is lagged for three years it is negatively associated with the three measures of firm performance i.e. Tobin's Q, ROA, and ROE. This result contradicts the hypothesis regarding the positive relationship between remuneration and firm performance. However, as reported earlier, it is consistent with some recent evidence in the context of financial sector. Furthermore, there is some evidence that TSR is positively associated with the three year lag of remuneration.

The relationship between board ownership and performance is also mixed, i.e. the one year lag is negatively associated with TSR, but the two year lag is positively associated with TSR. The three year lag is negatively associated with ROE. Similarly, Appendix 2 shows that extra board committees, internal control mechanisms and leverage also provide mixed results.

4.4.4 Corporate governance and firm performance for the whole sample (financial and non-financial firms combined)

In the previous sections the whole sample was divided between financial and non-financial firms and they were analysed separately. Section 4.4.1 describes the regression results for non-financial firms while Section 4.4.2 presents the regression results for financial firms. This section outlines the regression results when the sample firms were not divided between financial and non-financial firms and they are entered into the same model. The purpose of this analysis is to shed some light on how the results would appear if the whole sample of firms is analysed together and no distinction is made between financial and non-financial firms. Section 4.4.4.1 shows the results when the data is analysed for the period 2003–2010, Section 4.4.4.2 presents the results when the data is analysed for the period 2003–2006 and Section 4.4.4.3 describes the results for the period 2007–2010.

4.4.4.1 Corporate governance and firm performance for the whole sample (financial and non-financial firms combined) for the period 2003–2010

Appendix 3 provides the regression results for the whole sample (i.e. financial and non-financial firms) for the sample period 2003–2010. The comparison of these results for non-financial firms (Table 4.12) and financial firms (Table 4.15) for the same time period shows that these results are more similar to non-financial firms than financial firms. Especially, in terms of the impact of NEDs on performance. Similar to non-financial firms, Appendix 3 shows that the coefficient sign for NEDs and performance is negative, but it is statistically significant only for Tobin's Q and ROE. On the other hand, for financial firms over the same time period (Table 4.15) this relationship is strongly statistically significant for TSR, ROA and ROE. Apart from this, there is no other significant difference between

the results when the sample is analysed as whole or divided between financial and non-financial firms.

4.4.4.2 Corporate governance and firm performance for the whole sample (financial and non-financial firms combined) for the period 2003–2006

Appendix 4 shows the regression results for the whole sample for the period 2003–2006. Comparison of these results with the results for non-financial firms (Table 4.13) and financial firms (Table 4.16) shows that there are a few difference with financial firms, but for non-financial firms there are no significant differences.

For financial firms the key difference is in terms of the relationship between the NCI, ROA and ROE. When the data is analysed only for financial firms (Table 4.16) for the period 2003–2006 the NCI is significantly associated with ROA and ROE. However, when the whole sample is analysed the NCI is not associated with ROA and ROE. Similarly, NEDs negatively affect TSR (Table 4.16), but when the whole sample is analysed this relationship is not significant any more and the coefficient sign is also positive (see Appendix 4).

4.4.4.3 Corporate governance and firm performance for the whole sample (financial and non-financial firms combined) for the period 2007–2010

Appendix 5 shows the regression results for the whole sample for the period 2007–2010. Comparison of these results with the results for non-financial firms (Table 4.14) shows that these results are similar to the results for non-financial firms and there is no significant difference between the two sets of results. However, when compared with the results for financial firms (Table 4.17) there is a key difference between the two sets of results in terms of the relationship between NEDs and firm performance. NEDs is significantly negatively associated with TSR, ROA and ROE when the data is analysed

only for financial firms (see Table 4.17), but this relationship over the same time period is not significant any more when the data is analysed for the whole sample (see Appendix 5).

Overall Appendix 3, 4 and 5 show that when the data is analysed for the whole sample the results are consistent with the results when the data is analysed separately for non-financial firms. However, there are some differences in the results when the data is analysed for the whole sample and when analysed only for financial firms. The noticeable difference is in the results for the relationship between NEDs and performance. As discussed earlier, this could indicate that some corporate governance mechanisms might have different implications for financial and non-financial firms.

4.4.5 Corporate governance and firm survival during financial crisis

As discussed earlier, one aim of this study is to analyse the impact of internal corporate governance mechanisms on the survival of firms during the financial crisis. This section presents the regression results for the relationship between internal corporate governance mechanisms and firm survival.

Table 4.20 outlines the regression results for the relationship between corporate governance variables and the survival of firms during the financial crisis. Models 1, 2 and 3 in Table 4.20 show the regression results for the whole sample i.e, non-financial firms and financial firms.

Table 4.20 shows that the main explanatory variable the NCI does not affect the survival of firms during difficult economic times for any of the models. Indeed, even the interaction term between NCI and beta i.e. $NCI \times \beta$ is not associated with survival of firms. Similarly, board size, board independence and remuneration, as well as extra board committees are not associated with firm survival either. However, board ownership is significantly positively associated with survival in the case of financial firms only. The

findings relating to board ownership and survival do not support the hypothesised negative relationship between directors' share ownership and firm survival. This finding is consistent with the findings of (Filatotchev and Toms, 2003). Studying the survival of firms in a declining industry and using a sample of UK firms, Filatotchev and Toms (2003) report that directors' share ownership is significantly positively associated with the survival of firms.

Furthermore, and as hypothesised, leverage is significantly negatively associated with firm survival. This relationship is not statistically significant for non-financial firms, but is highly significant for financial firms and when the data is analysed for the whole sample. In addition, the existence of internal control mechanisms is negatively associated with survival for the whole sample. This potentially indicates the increased costs and the ineffectiveness of extra control mechanisms.

However, when the sample is divided between financial and non-financial firms, this relationship is significant and negative only for non-financial firms. For the financial firms, this relationship is not statistically significant, but the coefficient sign is positive. This suggests that having extra control mechanisms in place could be beneficial for financial firms, although they may not be as beneficial for non-financial firms. Table 4.20 also shows that none of the control variables, firm size, liquidity, capital, and beta, significantly affect the survival of firms during difficult times.

Table 4.20 Regression results for firm survival and corporate governance

Independent variables	Model 1 Whole sample	Model 2 Non-Financial firms	Model 3 Financial firms
NCI	-0.111 (0.177)	-0.175 (0.241)	0.707 (0.541)
Board size	-0.00499 (0.0942)	-0.0207 (0.137)	0.466 (0.360)
Board independence	1.349 (1.459)	0.0876 (2.293)	2.214 (4.992)
Remuneration	-0.00629 (0.105)	0.274 (0.222)	-0.438 (0.444)
Board ownership	0.0139 (0.0149)	0.00565 (0.0165)	0.514** (0.254)
Leverage	-0.0359*** (0.00923)	-0.0178 (0.0121)	-0.145*** (0.0383)
Beta	-0.635 (0.529)	-1.044 (0.638)	2.799 (2.113)
Extra committees	0.171 (0.147)	0.167 (0.165)	-0.228 (0.696)
Internal controls	-0.105* (0.0635)	-0.123* (0.0739)	0.0211 (0.217)
Firm size	-0.0678 (0.129)	-0.239 (0.201)	0.0128 (0.568)
NCI* Beta	0.239 (0.166)	0.282 (0.219)	-0.279 (0.530)
Liquidity	-0.0545 (0.104)	-0.198 (0.231)	0.0233 (0.192)
Capital	-0.00590 (0.00839)	-0.00386 (0.0110)	-0.00614 (0.0385)
Constant	2.125 (1.463)	2.553 (1.943)	-7.414 (6.370)
Observations	274	188	86

Table 4.20 provides the results for the relationship between corporate governance the survival of firms during financial crisis. Survival is a binary variable that is equal to 1 if a firm survives the financial crisis and 0 otherwise. A firm is considered to have survived the financial crisis if it did not receive any government bailouts, came out of the recession as a going concern (i.e. did not go bankrupt), or did not carry out any major corporate actions (e.g. mergers and acquisitions, shares issues). The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

Table 4.21 Summary of empirical results of the study related to the survival of firms during financial crisis

<i>Dependent variable firm survival</i>						
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Results for financial firms</i>	<i>sig*</i>	<i>Results for non-financial firms</i>	<i>sig*</i>
H1b	Board size	-	Accepted	No	Rejected	No
H2b	Board independence	+	Accepted	No	Accepted	No
H3b	Remuneration	+	Accepted	No	Rejected	No
H4b	Board ownership	-	Rejected	No	Rejected	Yes
H5b	Extra committees	+	Accepted	No	Rejected	No
H6b	Internal controls	+	Rejected	Yes	Accepted	No
H7b	Leverage	-	Accepted	No	Accepted	Yes
H8b	NCI	-	Accepted	No	Rejected	No

* This shows whether or not the result is statistically significant

4.5 Summary

This chapter aims to answer the research questions outlined in Chapter 2. The results show that, for non-financial firms, the level of non-compliance with the UK corporate governance code positively affects the performance of firms measured by TSR. However, this relationship is significant only when the data is analysed for the whole period (2003–2010). Although this result contradicts the hypothesised negative relationship between the NCI and performance, it is consistent with some existing studies. This finding supports the argument that internal corporate governance mechanisms of firms are determined by the specific business and information environment in which they operate. Therefore, imposing a standard set of internal corporate governance mechanisms on all firms might lead to a negative effect on the performance of some firms. Furthermore, these findings also show the benefits of the ‘comply or explain’ system of the UK corporate governance code. This indicates that firms which are non-compliant with the UK corporate governance code and provide justifications for their non-compliance, might actually be adopting internal corporate governance mechanisms which will lead to shareholders’ wealth maximisation.

With regard to financial firms, the results for the relationship between the NCI and firm performance are mixed. The NCI is negatively associated with ROA in the period 2003–2006, but is positively associated with ROE in the same period. Similarly, in the crisis period (2007–2010) NCI is positively associated with Tobin’s Q, but it is negatively associated with TSR.

As some studies suggest, corporate governance might affect the performance of firms by affecting their riskiness (measured by beta). Therefore, an interaction term between the NCI and beta is included in the model. When this interaction term is included,

the results show a consistent negative effect of NCI*Beta on firm performance for non-financial firms during the periods 2003–2010 and 2003–2006. However, this relationship is not significant for the period 2007–2010.

This finding supports the existing literature that the NCI could have a negative effect on performance for more risky firms. However, the inconsistent evidence during different time periods for different performance measures shows that the relationship between governance and performance is very complex and could be affected by various factors (such as economic growth of a country, customer base, technological change etc.). This highlights why research on the link between internal corporate governance mechanisms and performance has been inconclusive thus far, and has failed to produce consistent results.

For individual corporate governance mechanisms, the results show that board size is not associated with any of the performance measures for non-financial or financial firms. However, contradictory to the hypothesised positive relationship between board independence and performance, the results show consistent evidence that board independence is negatively associated with firm performance both for non-financial and financial firms. This relationship is stronger for financial firms across the different time periods and supports some of the recent research on financial firms.

For remuneration, the results show that this is negatively associated with the market based measures of performance, i.e. Tobin's Q and TSR for financial as well as non-financial firms. However, this relationship is again only significant when the data is analysed for the whole sample period (2003–2010). Furthermore, there is some evidence that board ownership is positively associated with firm performance for non-financial firms. However, board ownership affects the performance of non-financial firms negatively

in the crisis period (2007–2010). For financial firms, this relationship is significant and positive only in the pre-crisis period.

As expected, there is evidence that increasing the number of internal control mechanisms within an organisation will positively affect the performance of firms. This positive effect holds both for financial and non-financial firms for the periods 2003–2010 and 2003–2006. However, this relationship is not significant in the crisis period (2007–2010). Furthermore, consistent with the existing literature, the results show that having extra board committees negatively affects the performance of firms, but only in the case of non-financial firms.

In this chapter, the impact of internal corporate governance mechanisms on the survival of firms during the financial crisis was also analysed. The results show that the NCI is not associated with the survival of firms. Regarding the other internal corporate governance mechanisms, the results show that consistent with the stated hypothesis leverage is negatively associated with survival. This clearly indicates that firms with high levels of debt are less likely to survive during a financial crisis.

The results also show that board ownership is positively associated with the survival of firms, although this only applies to financial firms. This result again indicates that corporate governance mechanisms have different implications for firms in financial and non-financial sectors. The results also provide some weak evidence that having more internal control mechanisms negatively affects the survival of non-financial firms. This might indicate that these internal control mechanisms are costly for non-financial firms during difficult economic times.

Finally, when the lagged values of corporate governance are used, the results show some evidence that the corporate governance variables are significantly associated with

performance. This shows that corporate governance will affect the performance of firms after a period of time. Furthermore, when the whole sample of data is analysed most of the results are the same. Only for financial firms there is a difference in results in terms of the impact of NEDs on performance.

In the next chapter, the conclusion and implications of these findings will be discussed.

Chapter 5 Conclusions

5.1 Introduction

As outlined in Chapter 2, research on the link between corporate governance and firm performance has traditionally examined two broad questions. First it looks into the impact of individual corporate governance mechanisms (such as CEO duality, board size, board composition, and remuneration etc.) on firm performance. Secondly, it analyses the impact of the quality of corporate governance (based on compliance with the recommended corporate governance codes) on firm performance.

Although many theories (such as agency theory, stakeholder theory, resource dependence theory and stewardship theory) predict a positive link between corporate governance and firm performance, the empirical evidence on the link between internal corporate governance mechanisms and the performance of firms is far from conclusive. Studies carried out during different time periods or in different countries around the world have produced inconsistent results (Bozec and Bozec, 2012).

This study contributes to the debate by analysing the relationship between internal corporate governance mechanisms and the performance of firms for a sample of UK listed companies. As outlined in Section 1.2, the study addresses the following research questions. First, how does the level of compliance with the UK corporate governance code affect the performance of firms in financial and non-financial sectors? Secondly, does the overall economic environment (in terms of financial crisis) affect the relationship between corporate governance and the performance of firms? Thirdly, does the level of compliance with the UK corporate governance code affect the survival of firms during a financial crisis?

Fourthly, how do individual corporate governance mechanisms (such as board size, board independence, remuneration, board committees, internal control mechanism and leverage) affect the performance of firms? Fifthly, how does the overall economic environment affect the relationship between these individual corporate governance mechanisms and the performance of firms? Finally, do these internal corporate governance mechanisms affect the survival of firms during a financial crisis? The study is unique as both financial and non-financial firms are analysed over the same time period. Moreover, the study takes into account the recent financial crisis, which began in 2007.

Overall, the findings of the study are mixed. Non-compliance with the UK corporate governance code affects the performance of firms differently when different performance measures are used and when the data is analysed across different time periods. The non-compliance also affects the performance of financial and non-financial firms differently. Furthermore, the evidence regarding the relationship between individual corporate governance mechanisms and the performance of firms is mixed. The only corporate governance variable which has the same effect on performance across different time periods and when different performance measures are used is board independence. Regarding the relationship between corporate governance and survival, the results of the study show that the level of non-compliance with the UK corporate governance code is not associated with the survival of firms during the financial crisis. The internal corporate governance variables which significantly affect the survival of firms during the financial crisis are internal controls, leverage and board ownership.

The remainder of the chapter is organised as follows. Section 5.2 summarises the main empirical findings of the study. Section 5.3 summarises the implications of the findings. Section 5.4 discusses the limitations of the study and Section 5.5 suggests avenues for future research.

5.2 Summary of empirical findings

This section summarises the main empirical findings of the thesis.

5.2.1 Summary of findings related to the relationship between the NCI and firm performance

5.2.1.1 Non- Financial firms

Table 5.1 Summary of empirical results for the relationship between the NCI and performance for non-financial firms

Independent variable			NCI					
			Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
	Dependent variables	Expected sign	Result	Sig*	Result	Sig*	Result	Sig*
H8a	Tobin’s Q	-	Accepted	No	Accepted	No	Rejected	No
H8a	TSR	-	Rejected	Yes	Rejected	No	Accepted	No
H8a	ROA	-	Rejected	No	Rejected	No	Rejected	No
H8a	ROE	-	Rejected	No	Rejected	No	Rejected	No

* This shows whether or not the result is statistically significant

Statistically significant results are highlighted in bold

Table 5.1 summarises the results for the relationship between the NCI and the performance of non-financial firms (i.e. Tobin’s Q, TSR, ROA, and ROE). Table 5.1 shows that results are different for different measures of performance and across different time periods. Overall, these results highlight the complexities in the relationship between corporate governance and firm performance. The relationship between the NCI and firm performance changes when different performance measures are used. This shows that the association between internal corporate governance and firm performance is affected by the type of performance measure used. Therefore, these results provide some explanation for

the mixed findings on the link between internal corporate governance and firm performance in the existing literature.

5.2.1.2 Financial firms

Table 5.2 Summary of empirical results for the relationship between the NCI and performance for financial firms

<i>Independent variable</i>			<i>NCI</i>					
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>
<i>H8a</i>	Tobin’s Q	-	Rejected	No	Rejected	No	Rejected	Yes
<i>H8a</i>	TSR	-	Rejected	No	Accepted	No	Accepted	Yes
<i>H8a</i>	ROA	-	Rejected	No	Accepted	Yes	Rejected	No
<i>H8a</i>	ROE	-	Rejected	No	Accepted	Yes	Rejected	No

* This shows whether or not the result is statistically significant

Statistically significant results are highlighted in bold

Table 5.2 outlines the testable hypothesis and empirical results for financial firms. Table 5.2 shows that, consistent with *H8a*, the NCI is significantly negatively associated with the accounting based measures of performance, i.e. ROA and ROE in the pre-crisis period (2003–2006). However, the NCI is significantly associated with the market based measures of performance (i.e. Tobin’s Q and TSR) during the crisis period. In the crisis period, the NCI is negatively associated with Tobin’s Q, but positively associated with TSR.

Overall, the evidence is mixed and at times conflicting for different measures of performance, during different time periods, and in different sectors. This matches the inconclusiveness in the existing literature on the link between internal corporate governance and the performance of firms. If using different performance measures for the

same sample of firms produces mixed results, then it is not surprising to see that the existing evidence, from the studies carried out in various countries, is inconclusive.

5.2.2 Summary of findings related to the relationship between individual corporate governance mechanisms and firm performance

5.2.2.1 Non-financial firms

This section summarises the results for the relationship between various corporate governance variables and the performance of non-financial firms.

Table 5.3 Summary of empirical results for non-financial firms

<i>Dependent variable</i>			<i>Tobin's Q</i>					
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>
<i>H1a</i>	Board size	-	Accepted	No	Rejected	No	Accepted	No
<i>H2a</i>	Board independence	+	Rejected	Yes	Rejected	No	Rejected	Yes
<i>H3a</i>	Remuneration	+	Rejected	Yes	Rejected	No	Rejected	No
<i>H4a</i>	Board ownership	+	Accepted	Yes	Accepted	Yes	Rejected	No
<i>H5a</i>	Extra committees	-	Accepted	Yes	Accepted	No	Accepted	Yes
<i>H6a</i>	Internal controls	+	Accepted	Yes	Accepted	Yes	Rejected	No
<i>H7a</i>	Leverage	-	Rejected	Yes	Rejected	Yes	Rejected	Yes

<i>Dependent variable</i>			<i>TSR</i>					
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>
<i>H1a</i>	Board size	-	Rejected	No	Rejected	No	Rejected	No
<i>H2a</i>	Board independence	+	Accepted	No	Accepted	No	Accepted	Yes
<i>H3a</i>	Remuneration	+	Rejected	No	Accepted	No	Rejected	No
<i>H4a</i>	Board ownership	+	Accepted	No	Accepted	Yes	Rejected	No
<i>H5a</i>	Extra committees	-	Accepted	No	Accepted	No	Rejected	No
<i>H6a</i>	Internal controls	+	Rejected	No	Rejected	No	Accepted	No
<i>H7a</i>	Leverage	-	Accepted	Yes	Rejected	No	Accepted	Yes

Table 5.3 (continued)

Dependent variable		ROA						
			Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
	Independent variables	Expected sign	Result	Sig*	Result	Sig*	Result	Sig*
H1a	Board size	-	Accepted	No	Accepted	No	Rejected	No
H2a	Board independence	+	Rejected	No	Accepted	No	Accepted	No
H3a	Remuneration	+	Rejected	No	Accepted	No	Rejected	No
H4a	Board ownership	+	Rejected	No	Rejected	No	Rejected	Yes
H5a	Extra committees	-	Accepted	Yes	Accepted	No	Accepted	Yes
H6a	Internal controls	+	Accepted	Yes	Accepted	Yes	Rejected	No
H7a	Leverage	-	Rejected	Yes	Accepted	No	Rejected	Yes

Dependent variable		ROE						
			Whole period (2003-2010)		Pre-crisis (2003-2006)		During crisis (2007-2010)	
	Independent variables	Expected sign	Result	Sig*	Result	Sig*	Result	Sig*
H1a	Board size	-	Accepted	No	Rejected	No	Rejected	No
H2a	Board independence	+	Rejected	No	Rejected	No	Rejected	No
H3a	Remuneration	+	Accepted	No	Rejected	No	Accepted	Yes
H4a	Board ownership	+	Accepted	No	Accepted	No	Rejected	No
H5a	Extra committees	-	Accepted	No	Accepted	No	Rejected	No
H6a	Internal controls	+	Accepted	Yes	Accepted	Yes	Rejected	No
H7a	Leverage	-	Rejected	No	Accepted	No	Rejected	No

* This shows whether or not the result is statistically significant

Statistically significant results are highlighted in bold

Table 5.3 summarises the hypotheses and results for the relationship between various individual corporate governance variables of the study and the performance of firms. The overall theme that arises from Table 5.3 is that the results vary when different performance measures are used and across different time periods.

5.2.2.2 Financial firms

Table 5.4 Summary of empirical results for financial firms

<i>Dependent variable</i>		<i>Tobin's Q</i>						
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>
<i>H1a</i>	Board size	-	Rejected	No	Rejected	No	Accepted	No
<i>H2a</i>	Board independence	+	Rejected	No	Rejected	No	Rejected	No
<i>H3a</i>	Remuneration	+	Rejected	No	Rejected	No	Accepted	No
<i>H4a</i>	Board ownership	+	Rejected	No	Rejected	No	Accepted	No
<i>H5a</i>	Extra committees	-	Accepted	No	Rejected	No	Rejected	No
<i>H6a</i>	Internal controls	+	Accepted	Yes	Accepted	Yes	Rejected	No
<i>H7a</i>	Leverage	-	Rejected	No	Rejected	Yes	Rejected	Yes

<i>Dependent variable</i>		<i>TSR</i>						
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>	<i>Result</i>	<i>Sig*</i>
<i>H1a</i>	Board size	-	Accepted	No	Accepted	No	Accepted	No
<i>H2a</i>	Board independence	+	Rejected	Yes	Rejected	Yes	Rejected	Yes
<i>H3a</i>	Remuneration	+	Rejected	Yes	Rejected	No	Rejected	No
<i>H4a</i>	Board ownership	+	Rejected	No	Rejected	No	Rejected	No
<i>H5a</i>	Extra committees	-	Accepted	No	Rejected	No	Accepted	No
<i>H6a</i>	Internal controls	+	Accepted	No	Accepted	Yes	Rejected	No
<i>H7a</i>	Leverage	-	Accepted	No	Rejected	Yes	Accepted	Yes

Table 5.4 (continued)

<i>Dependent variable</i>		<i>ROA</i>						
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig *</i>	<i>Result</i>	<i>Sig *</i>	<i>Result</i>	<i>Sig *</i>
<i>H1a</i>	Board size	-	Rejected	No	Rejected	No	Accepted	No
<i>H2a</i>	Board independence	+	Rejected	Yes	Rejected	No	Rejected	Yes
<i>H3a</i>	Remuneration	+	Accepted	No	Accepted	No	Accepted	No
<i>H4a</i>	Board ownership	+	Accepted	No	Accepted	No	Rejected	No
<i>H5a</i>	Extra committees	-	Rejected	No	Accepted	No	Rejected	No
<i>H6a</i>	Internal controls	+	Rejected	No	Accepted	No	Accepted	No
<i>H7a</i>	Leverage	-	Rejected	No	Accepted	No	Rejected	No

<i>Dependent variable</i>		<i>ROE</i>						
			<i>Whole period (2003-2010)</i>		<i>Pre-crisis (2003-2006)</i>		<i>During crisis (2007-2010)</i>	
	<i>Independent variables</i>	<i>Expected sign</i>	<i>Result</i>	<i>Sig *</i>	<i>Result</i>	<i>Sig *</i>	<i>Result</i>	<i>Sig *</i>
<i>H1a</i>	Board size	-	Rejected	No	Rejected	No	Rejected	No
<i>H2a</i>	Board independence	+	Rejected	Yes	Rejected	No	Rejected	Yes
<i>H3a</i>	Remuneration	+	Rejected	No	Accepted	No	Accepted	No
<i>H4a</i>	Board ownership	+	Accepted	No	Accepted	Yes	Accepted	No
<i>H5a</i>	Extra committees	-	Accepted	No	Rejected	No	Rejected	No
<i>H6a</i>	Internal controls	+	Rejected	No	Rejected	No	Rejected	No
<i>H7a</i>	Leverage	-	Accepted	No	Accepted	No	Accepted	No

* This shows whether or not the result is statistically significant

Statistically significant results are highlighted in bold

Table 5.4 summarises the testable hypothesis for the relationship between various individual corporate governance mechanisms and the performance of financial firms. The noticeable result, shown in Table 5.4, is the finding related to the relationship between board independence and firm performance. Hypothesis *H2a* predicts that board independence is positively associated with the performance of firms. However, Table 5.4 shows that for financial firms, board independence is significantly negatively associated with firm performance across all of the three time periods. Although this finding does not support *H2a*, it is consistent with some recent evidence in respect of financial firms

regarding the link between board independence and the performance of firms (Pathan, 2009, Belkhir, 2009, Erkens et al., 2012, Aebi et al., 2012, Adams, 2012, Beltratti and Stulz, 2012).

5.2.3 Summary of findings related to the relationship between internal corporate governance mechanisms and firm survival during difficult times

5.2.3.1 Non- financial firms

Table 5.5 Summary of empirical results of the study related to the survival of non-financial firms

<i>Dependent Variable firm Survival</i>				
	<i>Independent Variables</i>	<i>Expected sign</i>	<i>Results</i>	<i>sig*</i>
H1b	Board size	-	Accepted	No
H2b	Board independence	+	Accepted	No
H3b	Remuneration	+	Accepted	No
H4b	Board ownership	-	Rejected	No
H5b	Extra committees	+	Accepted	No
H6b	Internal controls	+	Rejected	Yes
H7b	Leverage	-	Accepted	No
H8b	NCI	-	Accepted	No

* This shows whether or not the result is statistically significant

Statistically significant results are highlighted in bold

Table 5.5 summarises the testable hypotheses and results for the relationship between internal corporate governance and the survival of firms during the financial crisis. The testable hypothesis related to the association between the NCI and firm survival is that the NCI is negatively associated with firm survival. Consistent with this hypothesis, the results in Table 5.5 show that the NCI is negatively associated with the survival of non-financial firms. Although this relationship is not statistically significant, the negative

coefficient sign shows that a higher level of non-compliance could increase a firm’s chances of failure during a crisis.

As far as the individual corporate governance mechanisms are concerned, only internal control mechanisms are significantly associated with survival. However, this result does not support *H6b*. The coefficient sign is negative, thus indicating that internal controls could be costly during difficult economic times, such as a financial crisis.

5.2.3.2 Financial firms

Table 5.6 Summary of empirical results of the study related to the survival of financial firms

<i>Dependent Variable firm Survival</i>				
	<i>Independent Variables</i>	<i>Expected sign</i>	<i>Results</i>	<i>sig*</i>
H1b	Board size	-	Rejected	No
H2b	Board independence	+	Accepted	No
H3b	Remuneration	+	Rejected	No
H4b	Board ownership	-	Rejected	Yes
H5b	Extra committees	+	Rejected	No
H6b	Internal controls	+	Accepted	No
H7b	Leverage	-	Accepted	Yes
H8b	NCI	-	Rejected	No

* This shows whether or not the result is statistically significant

Statistically significant results are highlighted in bold

Table 5.6 summarises the testable hypotheses and results for the relationship between internal corporate governance and the survival of financial firms during the financial crisis. For financial firms, the results do not support *H8b*, which states that the NCI is negatively associated with the survival of firms. However, this relationship is not statistically significant. The individual internal corporate governance mechanisms significantly associated with the survival of financial firms are directors’ share ownership

and leverage. Consistent with Filatotchev and Toms (2003) board ownership is positively associated with firm survival during the financial crisis. This indicates that firms in which directors have a high percentage of shareholdings are more likely to survive difficult economic times.

The theoretical justification for the positive relationship between board ownership and survival comes from agency theory. As argued by Jensen and Meckling (1976), increasing directors' shareholdings should lead to the greater alignment of interests between shareholders and directors. Therefore, if directors' interests are aligned with shareholders' interests then directors will take decisions which are in the long term interest of the firms. Consequently, in difficult economic times, such firms will be more likely to survive.

The summarised results in Table 5.6 also show that leverage is negatively associated with firm survival. This finding is consistent with hypothesis *H7b* and with the existing literature on the link between leverage and firm survival during a financial crisis (Graham and Narasimhan, 2004, Adams, 2012). This finding indicates that firms with high levels of debt financing find it difficult to service or refinance their debts during a financial crisis. Their chances of survival during a crisis therefore decrease.

5.3 Implications

5.3.1 Implication of the findings related to the non-compliance index

As discussed in Section 5.2, the results of the study in terms of the relationship between the NCI and the performance of firms are mixed. In the context of this study, three theories (i.e. agency theory, resource dependence theory, and stewardship theory) are used to investigate the link between internal corporate governance and the performance of firms. As discussed in Section 2.2, these theories provide alternative views on the relationship

between internal corporate governance and the performance of firms. These alternative views, at times, could conflict with one another.

The results reflect the alternative theoretical views on the relationship between internal corporate governance and the performance of firms. For example, agency theory and resource dependence theory predict a positive relationship between a higher number of NEDs and firm performance. On the other hand, stewardship theory postulates that increasing the number of NEDs will lead to more costs without improving firm performance. In the context of this study, the UK corporate governance code also encourages companies to appoint a higher number of NEDs on boards.

Therefore, if a company is compliant with the UK corporate governance code with respect to appointing NEDs onto boards, then as predicted by agency and resource dependence theory, it should perform better. On the other hand, stewardship theory predicts that the performance of such firms might deteriorate. Both these alternative views are highlighted by the results of this study as the relationship between the NCI and performance is positive as well as negative. In light of these findings, it is argued that corporate governance research should apply multiple theoretical perspectives in order to investigate the underlying relationship between corporate governance and the performance of firms.

Another implication of these findings is methodological. Results of the study show that the relationship between the NCI and the performance of firms is not robust. Using different measures of firm performance and analysing the data in different time periods leads to conflicting results. This shows that the relationship between internal corporate governance and the performance of firms is highly dependent on the type of performance measures used and time period of the study. This provides some explanation for the inconclusive evidence in the existing literature.

Some researchers argue that corporate governance variables affect the performance of firms after a certain period of time. Therefore, using the contemporaneous values of corporate governance variables might not show any association between governance and performance. To overcome this problem in this study corporate governance variables were lagged for three years. However, the results do not change regarding the relationship between the NCI and firm performance. This could imply that corporate governance is not the solution to everything and that it may have a limited impact on firm performance.

The findings also imply that recommending the same set of internal corporate governance mechanisms for all firms does not produce the same effect. Firms with different sizes and which operate in different industries will have different corporate governance needs, as the nature and severity of agency issues could be different. Therefore, to minimise agency problems these organisational differences should be taken into account when developing internal corporate governance codes.

The different results for financial and non-financial firms imply that the same set of internal corporate governance mechanisms will have different implications for different types of firms. We have seen that while non-compliance is associated with poor performance for firms in the non-financial sector, it is associated with better performance in the financial sector or vice versa.

For investors the implication of this finding is that non-compliance with the UK corporate governance code provides mixed results. Compliance with the UK corporate governance code is associated with better performance in some cases, indicating that strong corporate governance mechanisms are important for protecting shareholders' interests. On the other hand, some of the results also show that non-compliance is associated with better firm performance. This indicates that firms which adopt alternative corporate governance mechanisms to those recommended by the UK corporate governance

code and provide explanation for their non-compliance, may perform as well as or better than compliant firms. However, as stated earlier, the results are mixed and the implications of the findings are not straightforward.

For policy makers, the implication of this finding is that the system of ‘comply or explain’ is working well and there is no need to make compliance with the UK corporate governance code compulsory. The findings also indicate that the association between the NCI and performance is different in financial and non-financial sectors. Therefore, this could imply that certain provisions of the UK corporate governance code might be more suitable for some industries than others. Hence, these industry specific differences should be taken into account in the development of the codes. The organisational needs, nature of agency problems, and needs of stakeholders are different in different industries. Therefore, taking these industry specific differences into account will make the code more attractive for all types of firms. This will also enhance the usefulness of the code in meeting the needs of various stakeholders across all industries.

5.3.2 Implication of the findings related to individual corporate governance mechanisms

As discussed in Sections 5.2.2.1 and 5.2.2.2, the findings of the study in terms of the relationship between individual corporate governance mechanisms and the performance of firms are mixed. This highlights the different theoretical perspectives on the relationship between internal corporate governance mechanisms and the performance of firms.

The finding that there is no statistically significant relationship between board size and firm performance both in financial and non-financial sectors shows that board size is an endogenous choice by firms. Therefore, every organisation’s board size will reflect its

organisational needs as well as the costs and benefits associated with it. This implies that board size alone should not affect firm performance. This finding justifies why there is no provision related to the minimum and maximum number of board members in the UK corporate governance code. The UK corporate governance code only requires that every company should have an effective board. Therefore, it is left to the companies to determine what might be an effective board size for their organisations.

For financial firms, the finding that board independence is negatively associated with firm performance reiterates that the same set of internal corporate governance mechanisms will have different implications for firms in different industries.

Due to the complexity of operations and the large size of firms in the financial sector, increasing the number of NEDs on board will negatively affect firm performance. As suggested by some studies, NEDs lack adequate knowledge (Vafeas and Theodorou, 1998, Adams, 2012) to advise, monitor, and challenge the executive directors. Therefore, increasing the number of NEDs will increase agency cost for such firms.

The negative relationship between board independence and firm performance supports the stewardship theory. Stewardship theory postulates that executives are trustworthy individuals and will work in the best interest of the owners (Donaldson and Davis, 1991). Therefore, there is no need to employ NEDs to monitor executive directors, as employing NEDs will incur extra costs for firms. The negative relationship between NEDs and firm performance could also indicate a lack of business knowledge on the part of NEDs and highlight the difficulties which they may face when attempting to understand the complexities of firms (Vafeas and Theodorou, 1998, Adams, 2012).

Alternatively, there could be another explanation for the negative relationship between NEDs and performance in the case of financial firms. The financial crisis has had

a greater impact on the profitability of firms in the financial sector. During the financial crisis, the performance of financial firms has deteriorated more when compared with non-financial firms. Therefore, firms in the financial sector would have suffered higher losses due to the financial crisis rather than due to the higher ratio of NEDs.

The positive relationship between NEDs and performance during the crisis period for non-financial firms supports the resource dependence theory. The resource dependence theory considers NEDs as a link between firms and the resources in the external environment. If firms are better connected through NEDs to external resources, this will have a positive impact on firm performance during difficult economic times. In the case of non-financial firms, the results suggest, as predicted by the resource dependence theory, that NEDs play a crucial role in connecting firms with critical resources during the financial crisis.

The mixed results for the relationship between individual corporate governance mechanisms and the performance of firms highlight the contrasting theoretical perspectives on this relationship. This implies that the relationship between individual corporate governance mechanisms and the performance of firms should be studied, all the while bearing in mind these alternative theoretical perspectives. Studying this relationship from only one theoretical perspective would not provide adequate information in terms of understanding the governance-performance relationship.

The results of the study are not robust when different performance measures are used, and when the data is analysed over different time periods. From a methodological view point, this highlights the need to develop sound methodologies and statistical techniques with which to study the relationship between internal corporate governance and the performance of firms. In a recent study, Wintoki et al. (2012) highlight this issue. They show that these mixed results in the existing literature are attributed to using inappropriate

statistical techniques. They also argue that employing proper statistical tools (i.e. Generalised Methods of Moments (GMM)) could produce more consistent results.

Due to the mixed nature of the results, it is difficult to outline the implications for investors and policy makers. However, the mixed evidence across different time periods and in different industries highlights one important issue. The issue is that recommending a standard set of internal corporate governance mechanisms for all firms across different industries might not achieve the objective of good corporate governance.

Agency problems will differ across different industries. In addition, agency problems within firms will be different in a challenging economic environment (i.e. a financial crisis) when compared with a stable economic environment. Therefore, firms' internal corporate governance mechanisms should also change accordingly to reflect these different agency problems and protect the interests of all its stakeholders.

If the internal corporate governance mechanisms of firms do not reflect these changes and remain the same across different industries and in different economic environments, a governance mechanism which might be associated with better performance in one industry at one point in time could well be associated with poor performance in another industry in another time period. Therefore, mixed relationships between internal corporate governance and performance will be observed.

5.3.3 Implication of the findings related to firm survival during financial crisis

The finding that the NCI is not significantly associated with the survival of firms implies that even if firms are non-compliant with the recommended best practices, but adopt corporate governance mechanisms based on their organisational needs, then the survival of such firms should not be affected during a financial crisis.

Furthermore, this indicates the effectiveness of the ‘comply or explain’ system in the UK. The UK corporate governance code recommends the code of best practice. However, companies can choose not to comply with the recommended provisions of the code and provide explanation for their non-compliance. Therefore, these results justify the ‘comply or explain’ approach, as the evidence does not support the view that the non-compliant firms (i.e. the firms that provide explanations) are more likely to fail during financial crisis.

As far as the relationship between individual internal corporate governance mechanisms and the survival of firms is concerned, the results are again mixed. The summarised results in Table 5.5 and Table 5.6 show that the same set of internal corporate governance mechanisms have different implications for the survival of financial and non-financial firms during a financial crisis.

As discussed in Section 5.3.2, it is difficult to outline the implications of these mixed results. However, the results do indicate the importance of NEDs for the survival of firms both in the financial and non-financial sectors. This highlights the important role which NEDs can play by linking organisations to critical resources during difficult times. This view is contradictory to the negative relationship between NEDs and firm performance discussed earlier. These results underline the contrasting theoretical perspectives on the link between corporate governance and the performance of firms.

5.4 Limitations of the study

The first limitation of the study comes from the sample selection. The study is based on firms listed only on the FTSE350. Therefore, it is possible that the results could be driven by country specific characteristics. Due to time limitations it was not possible to carry out a cross country study. Compared with other UK based studies, the sample size of

this study is fairly large and includes both financial and non-financial firms. This limitation is therefore, to some extent, mitigated.

The second limitation of the study comes from the use of the corporate governance index. The index is constructed giving equal weight to all provisions, although it is possible that some provisions could be more important than others. Therefore, treating all provisions as equally important might have affected the validity and reliability of the results. However, there is no objective criterion available on which weight should be allocated to each individual provision. Therefore, using an equal weighted index is the best available option as it does not involve any subjective judgment by the researcher.

The third limitation is that the index is developed by reading only the annual reports. If surveys and interviews were conducted with board members it would increase the validity and explanation power of the index. However, again due to time constraints, this was not possible for this study.

The fourth limitation of the study originates from the use of accounting numbers. In some cases, accounting regulations allow firms to adopt alternative accounting policies. These alternative policies could have major implications for various balance sheet and income statement items. Therefore, comparing firms which might have adopted different accounting policies could affect the validity of the study.

5.5 Future research

In terms of future research, the study could be extended to include other countries where the 'comply or explain' system is in place. It will be interesting to analyse how the same level of compliance with the respective corporate governance code in each country affects firm performance.

The index in this study is developed by reading only the annual reports. For future research surveys and interviews could be conducted with board members and shareholders in order to cross check the level of compliance with the UK corporate governance code.

Interviews could well be conducted with shareholders so as to analyse how much importance they place on compliance with the provisions of the UK corporate governance code. Following this, a weighted scheme could be developed based on their responses to analyse how this affects the results.

Another avenue for future research could be to analyse the explanations provided by firms for their non-compliance with the UK corporate governance code. Following this, the effect of these explanations on the performance of firms could be investigated.

In this study, only internal corporate governance mechanisms are used in order to analyse their impact on firm performance. For future research external corporate governance mechanisms such as market for corporate control (takeovers and mergers), managerial labour market (mechanisms to replace poor performing management) and corporate laws could also be included so as to analyse how these affect the performance of firms.

Appendices

Appendix 1: Non-financial firms' regression results for firm performance and corporate governance variables (lagged for three years)

Independent Variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.00113 (0.00791)	1.867 (1.828)	0.193 (0.329)	0.0577 (0.301)
L.NCI	0.00127 (0.00717)	-0.586 (2.005)	-0.0364 (0.298)	0.122 (0.272)
L2.NCI	-0.00766 (0.00653)	1.586 (1.777)	0.0488 (0.271)	-0.113 (0.248)
L3.NCI	-0.00158 (0.00610)	-0.519 (1.462)	0.0204 (0.253)	0.241 (0.232)
Board size	-0.00669 (0.00489)	1.176 (1.157)	0.0974 (0.203)	-0.238 (0.186)
L.Board size	0.00828* (0.00475)	0.903 (1.268)	-0.0873 (0.198)	-0.00514 (0.181)
L2.Board size	0.00381 (0.00460)	-3.845*** (1.258)	0.376** (0.191)	0.148 (0.175)
L3.Board size	-0.00491 (0.00438)	0.962 (1.069)	-0.174 (0.182)	-0.291* (0.167)
Board ind	-0.169*** (0.0549)	23.12* (12.81)	-0.831 (2.282)	-5.972*** (2.087)
L.Board ind	-0.0676 (0.0448)	16.52 (11.25)	-1.544 (1.860)	-3.391** (1.701)
L2.Board ind	-0.166*** (0.0492)	-12.33 (11.91)	-4.119** (2.042)	-6.015*** (1.868)
L3.Board ind	-0.0853** (0.0397)	8.242 (10.12)	-2.033 (1.651)	-3.957*** (1.510)
Remuneration	-0.00658* (0.00387)	-1.076 (0.924)	-0.333** (0.161)	-0.128 (0.147)
L.remuneration	-0.0149*** (0.00392)	2.036** (0.957)	-0.294* (0.163)	-0.520*** (0.149)
L2.remuneration	-0.0175*** (0.00436)	0.799 (1.127)	-0.919*** (0.181)	-0.545*** (0.166)
L3.remuneration	-0.00309 (0.00447)	1.119 (1.209)	-0.720*** (0.186)	-0.128 (0.170)
Boardown	-0.00401** (0.00175)	0.159 (0.365)	-0.208*** (0.0727)	-0.101 (0.0665)
L.Boardown	0.00117 (0.00179)	-0.115 (0.456)	0.0273 (0.0744)	0.0766 (0.0680)
L2.Boardown	0.00120 (0.00166)	-0.132 (0.445)	0.0538 (0.0691)	-0.0196 (0.0632)
L3.Boardown	-0.00105 (0.00126)	0.141 (0.324)	-0.0137 (0.0525)	0.0295 (0.0480)
Leverage	0.000636 (0.000496)	-0.330*** (0.111)	0.0574*** (0.0206)	-0.0107 (0.0188)
L.Leverage	-0.00157*** (0.000473)	-0.0416 (0.121)	-0.0506** (0.0197)	-0.0287 (0.0180)

L2.Leverage	-0.00102** (0.000441)	0.00366 (0.112)	-0.0294 (0.0183)	-0.0225 (0.0168)
L3.Leverage	-0.000693 (0.000455)	0.0515 (0.105)	0.00167 (0.0189)	0.0224 (0.0173)
Beta	-0.0365** (0.0165)	31.90*** (4.140)	-0.834 (0.686)	-0.674 (0.627)
extcmmtt	-0.0177 (0.0184)	-6.807 (4.256)	-1.095 (0.765)	-0.0924 (0.699)
L.extcmmtt	-0.0453** (0.0203)	3.883 (5.797)	-0.00944 (0.842)	-0.232 (0.770)
L2.extcmmtt	0.0245 (0.0181)	15.88*** (5.337)	-0.166 (0.754)	-0.271 (0.689)
L3.extcmmtt	0.00243 (0.0160)	-11.01*** (3.848)	-0.263 (0.665)	0.264 (0.608)
intctlm	-0.0199 (0.0132)	-1.419 (2.607)	-0.472 (0.547)	-0.169 (0.500)
L.intctlm	-0.0125 (0.0133)	-0.931 (3.181)	-0.00642 (0.553)	0.0169 (0.505)
L2.intctlm	-0.000869 (0.00757)	-0.839 (2.094)	0.275 (0.315)	-0.0200 (0.288)
L3.intctlm	-0.0182*** (0.00470)	2.604** (1.224)	-0.558*** (0.195)	-0.644*** (0.178)
NCI*Beta	-0.00863* (0.00498)	-1.670 (1.236)	-0.223 (0.207)	-0.526*** (0.189)
L.NCI*Beta	0.0114** (0.00475)	2.415* (1.306)	0.0154 (0.197)	0.191 (0.180)
L2.NCI*Beta	0.00877* (0.00475)	-3.304*** (1.243)	0.267 (0.197)	0.287 (0.180)
L3.NCI*Beta	0.00251 (0.00461)	1.297 (1.073)	0.0685 (0.192)	-0.0429 (0.175)
Firm size	-0.0716*** (0.0246)	-3.820** (1.587)	3.636*** (1.023)	1.709* (0.935)
Liquidity	-0.0224*** (0.00840)	-1.245 (1.518)	-0.0948 (0.349)	-0.254 (0.319)
capital	0.00112** (0.000487)	-0.0585 (0.0725)	0.121*** (0.0202)	0.161*** (0.0185)
Constant	2.215*** (0.201)	-15.95 (14.18)	28.93*** (8.332)	31.64*** (7.619)
Observations	903	903	903	903
R-squared	0.291	*	0.271	0.272
Number of firms	188	188	188	188

Appendix 1 provides the results when corporate governance variables are lagged for three years. L, L2 and L3 represent lagged one year, lagged two years and lagged three years respectively. Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

*R-squared not reported, as random effects regression is used.

Appendix 2: Financial firms' regression results for firm performance and corporate governance variables (lagged for three years)

Independent Variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.00333 (0.00897)	-5.818** (2.622)	0.730 (0.631)	0.632 (0.704)
L.NCI	0.00570 (0.00989)	3.019 (3.127)	0.855 (0.662)	1.316* (0.739)
L2.NCI	-0.00762 (0.00978)	5.705* (3.137)	0.532 (0.628)	0.696 (0.702)
L3.NCI	-0.0102 (0.00804)	-5.355** (2.353)	1.425** (0.574)	0.655 (0.641)
Board size	8.12e-05 (0.00482)	-1.072 (1.380)	-0.0418 (0.342)	0.332 (0.382)
L.Board size	-0.00281 (0.00509)	1.520 (1.566)	0.0163 (0.344)	-0.0776 (0.384)
L2.Board size	0.00106 (0.00500)	-1.447 (1.562)	0.0790 (0.332)	-0.138 (0.371)
L3.Board size	-0.00162 (0.00443)	1.896 (1.311)	-0.0691 (0.299)	0.108 (0.334)
Board ind	-0.0750* (0.0441)	-35.41*** (12.06)	-12.09*** (3.214)	-7.544** (3.590)
L.Board ind	-0.00868 (0.0373)	-7.825 (11.00)	-0.805 (2.567)	6.223** (2.866)
L2.Board ind	-0.0146 (0.0414)	-2.444 (11.73)	3.897 (2.934)	4.685 (3.277)
L3.Board ind	-0.0248 (0.0341)	27.85*** (10.28)	-0.0364 (2.300)	1.698 (2.568)
Remuneration	-0.00296 (0.00266)	-1.099 (0.682)	-0.0852 (0.200)	-0.203 (0.223)
L.remuneration	0.00130 (0.00231)	0.401 (0.740)	0.0270 (0.151)	-0.00889 (0.168)
L2.remuneration	0.000112 (0.00283)	-1.308 (0.848)	0.0901 (0.195)	-0.116 (0.218)
L3.remuneration	-0.00515* (0.00275)	2.554*** (0.844)	-0.338* (0.186)	-0.368* (0.208)
Boardown	0.00197 (0.00141)	-0.0795 (0.411)	-0.0721 (0.102)	0.0802 (0.114)
L.Boardown	0.000390 (0.00171)	-1.121** (0.525)	0.0719 (0.122)	0.0686 (0.136)
L2.Boardown	-0.000730 (0.00172)	1.543*** (0.530)	-0.173 (0.123)	-0.138 (0.137)
L3.Boardown	0.00195 (0.00163)	0.279 (0.481)	-0.00638 (0.121)	-0.227* (0.135)
Leverage	0.00224*** (0.000752)	-0.441** (0.220)	0.0245 (0.0546)	-0.0243 (0.0610)
L.Leverage	-0.00181** (0.000737)	0.239 (0.234)	-0.0221 (0.0500)	0.0392 (0.0558)
L2.Leverage	-0.00243*** (0.000761)	-0.361 (0.241)	0.0726 (0.0526)	0.0412 (0.0588)
L3.Leverage	-0.000325 (0.000728)	0.441** (0.213)	0.0405 (0.0537)	-0.0335 (0.0600)

Beta	0.00882 (0.0240)	14.86** (7.195)	-3.569** (1.571)	-0.469 (1.754)
Extcmmtt	-0.00140 (0.0199)	-12.02** (5.769)	0.0894 (1.373)	1.236 (1.533)
L.extcmmtt	-0.0287 (0.0229)	14.90** (7.417)	2.108 (1.460)	-0.533 (1.631)
L2.extcmmtt	-0.0135 (0.0214)	-7.073 (6.892)	-1.309 (1.376)	-0.0752 (1.536)
L3.extcmmtt	0.00390 (0.0182)	1.561 (5.187)	-0.910 (1.265)	-1.041 (1.413)
intctlm	-0.00130 (0.00860)	0.782 (2.626)	0.375 (0.555)	-0.696 (0.620)
L.intctlm	0.0258* (0.0136)	5.794 (3.709)	-2.466 (3.743)	-0.204 (4.180)
L2.intctlm	-0.00630 (0.0107)	-11.07*** (3.520)	0.475 (0.674)	0.0212 (0.752)
L3.intctlm	-0.00830 (0.00841)	4.506* (2.523)	-0.811 (0.555)	-0.546 (0.620)
NCI*Beta	-0.00768 (0.00710)	6.270*** (2.130)	-0.928** (0.459)	-0.718 (0.512)
L.NCI*Beta	0.00434 (0.00896)	-3.228 (2.865)	-0.313 (0.581)	-0.442 (0.648)
L2.NCI*Beta	0.00782 (0.0101)	-6.316* (3.242)	-0.359 (0.653)	-0.379 (0.729)
L3.NCI*Beta	-0.00183 (0.00860)	5.081** (2.460)	-1.331** (0.616)	-0.941 (0.688)
Firm size	0.0166* (0.00963)	1.970 (1.627)	0.647 (1.253)	4.324*** (1.399)
Liquidity	0.000952 (0.00190)	0.692 (0.507)	-0.0300 (0.124)	-0.0965 (0.138)
capital	-0.00130*** (0.000342)	0.293*** (0.0848)	0.108*** (0.0239)	0.207*** (0.0267)
Constant	0.984*** (0.127)	-7.632 (20.33)	24.84 (38.60)	-1.987 (43.11)
Observations	421	421	421	421
R-squared	*	*	0.309	0.321
Number of firms	86	86	86	86

Appendix 2 provides the results when corporate governance variables are lagged for three years. L, L2 and L3 represent lagged one year, lagged two years and lagged three years respectively. Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

*R-squared not reported, as random effects regression is used.

**Appendix 3 Corporate governance and firm performance for the whole sample
(financial and non-financial firms combined) for the period 2003–2010**

Independent variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.000225 (0.00385)	1.742* (1.038)	0.166 (0.157)	0.197 (0.149)
Board size	-0.00264 (0.00271)	0.340 (0.731)	-0.0449 (0.110)	-0.0787 (0.105)
Board independence	-0.0431* (0.0255)	-6.501 (6.864)	-1.187 (1.037)	-2.343** (0.985)
Remuneration	-0.00324 (0.00201)	-1.333** (0.540)	0.00566 (0.0816)	-0.0285 (0.0775)
Board ownership	0.00251*** (0.000835)	0.201 (0.225)	-0.0225 (0.0340)	0.0365 (0.0323)
Leverage	0.00126*** (0.000329)	-0.293*** (0.0888)	0.0408*** (0.0134)	0.00326 (0.0127)
Beta	-0.0279*** (0.0103)	8.297*** (2.763)	-2.035*** (0.418)	-1.531*** (0.396)
Extra committees	-0.0201** (0.00823)	-3.725* (2.217)	-0.854** (0.335)	-0.330 (0.318)
Internal controls	0.0408*** (0.00326)	-1.188 (0.878)	0.522*** (0.133)	0.175 (0.126)
NCI*Beta	-4.49e-05 (0.00296)	-1.786** (0.799)	-0.277** (0.121)	-0.208* (0.115)
Firm size	-0.00139 (0.00938)	-11.86*** (2.528)	1.376*** (0.382)	0.891** (0.363)
Liquidity	-0.000251 (0.00190)	0.196 (0.511)	0.0368 (0.0772)	0.000634 (0.0733)
Capital	0.000953*** (0.000261)	0.0519 (0.0704)	0.0926*** (0.0106)	0.141*** (0.0101)
Constant	0.551*** (0.0473)	25.25** (12.74)	3.244* (1.925)	1.907 (1.828)
Observations	2,146	2,146	2,146	2,146
R-squared	0.119	0.036	0.109	0.136
Number of firms	274	274	274	274

Appendix 3 provides the results when the data is analysed for the whole sample (financial and non-financial firms) for the period (i.e. 2003–2010). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

**Appendix 4 Corporate governance and firm performance for the whole sample
(financial and non-financial firms combined) for the period 2003–2006**

Independent variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.00173 (0.00525)	1.165 (1.213)	0.0279 (0.188)	-0.114 (0.185)
Board size	0.000228 (0.00378)	0.0264 (0.875)	0.0180 (0.135)	0.107 (0.134)
Board independence	-0.00821 (0.0305)	0.981 (7.057)	-0.533 (1.092)	-1.034 (1.079)
Remuneration	-0.00448 (0.00336)	0.196 (0.776)	0.0624 (0.120)	-0.0433 (0.119)
Board ownership	0.00441*** (0.00115)	0.692*** (0.266)	-0.000742 (0.0411)	0.0542 (0.0406)
Leverage	0.00111** (0.000476)	0.121 (0.110)	0.00456 (0.0170)	-0.0199 (0.0168)
Beta	0.0392* (0.0204)	-7.493 (4.707)	1.799** (0.728)	1.113 (0.720)
Extra committees	-0.00564 (0.0141)	-2.260 (3.255)	-0.397 (0.504)	-0.0520 (0.498)
Internal controls	0.0435*** (0.00398)	-0.344 (0.920)	0.325** (0.142)	0.275* (0.141)
NCI*Beta	-0.00395 (0.00423)	-1.735* (0.977)	-0.438*** (0.151)	-0.0404 (0.149)
Firm size	0.0371** (0.0158)	-7.568** (3.663)	2.159*** (0.567)	1.532*** (0.560)
Liquidity	0.00336 (0.00330)	0.0247 (0.762)	0.0330 (0.118)	-0.0129 (0.116)
Capital	0.00197*** (0.000445)	0.0657 (0.103)	0.0903*** (0.0159)	0.103*** (0.0157)
Constant	0.371*** (0.0649)	25.32* (15.00)	1.652 (2.321)	-1.318 (2.293)
Observations	1,096	1,096	1,096	1,096
R-squared	0.251	0.032	0.098	0.094
Number of firms	274	274	274	274

Appendix 4 provides the results when the data is analysed for the whole sample (financial and non-financial firms) for the period (i.e. 2003–2006). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

**Appendix 5 Corporate governance and firm performance for the whole sample
(financial and non-financial firms combined) for the period 2007–2010**

Independent variables	Model 1 Tobin's Q	Model 2 TSR	Model 3 ROA	Model 4 ROE
NCI	0.0161 (0.00982)	-12.15*** (4.561)	1.659*** (0.534)	0.379 (0.509)
Board size	-0.00762 (0.00464)	0.604 (2.153)	0.238 (0.252)	0.197 (0.240)
Board independence	-0.0128 (0.0389)	-12.98 (18.07)	-0.771 (2.117)	-1.627 (2.017)
Remuneration	0.00229 (0.00245)	-2.873** (1.139)	0.0980 (0.133)	0.0329 (0.127)
Board ownership	-0.00125 (0.00147)	-0.809 (0.685)	-0.0975 (0.0802)	0.0278 (0.0765)
Leverage	0.00178*** (0.000571)	-1.099*** (0.265)	0.0790** (0.0311)	-0.0444 (0.0296)
Beta	-0.0176 (0.0152)	44.95*** (7.047)	-2.705*** (0.826)	0.468 (0.787)
Extra committees	0.0126 (0.0202)	-1.769 (9.391)	-1.372 (1.100)	1.235 (1.049)
Internal controls	-0.00975 (0.00841)	-1.108 (3.905)	-0.0715 (0.457)	-0.620 (0.436)
NCI*Beta	-0.0120** (0.00556)	4.457* (2.581)	-0.823*** (0.302)	-0.287 (0.288)
Firm size	0.0155 (0.0216)	5.213 (10.02)	-0.00519 (1.173)	3.835*** (1.118)
Liquidity	-0.000721 (0.00287)	0.415 (1.333)	0.0280 (0.156)	0.0104 (0.149)
Capital	0.000600 (0.000391)	-0.0523 (0.181)	0.0502** (0.0213)	0.196*** (0.0203)
Constant	0.969*** (0.0937)	28.86 (43.53)	5.851 (5.099)	0.452 (4.860)
Observations	782	782	782	782
R-squared	0.065	0.215	0.132	0.182
Number of firms	266	266	266	266

Appendix 5 provides the results when the data is analysed for the whole sample (financial and non-financial firms) for the period (i.e. 2006–2010). Tobin's Q, TSR, ROA, and ROE are dependent variables. The independent variables are NCI (level of non-compliance with the UK corporate governance code), Board size (total number of board members), Board independence (the ratio of non-executive directors on board), Remuneration (total remuneration of board members), Board ownership (total percentage of shares held by the board of directors), Leverage (the ratio of total debt to assets), Beta (a measure of systematic risk), Extra committees (the number of extra board committees in addition to nomination, audit, and remuneration committees), Internal controls (the number of internal control mechanisms in place within the company), NCI*Beta (interaction term between NCI and Beta), Firm size (log of total sales), Liquidity (the ratio of current assets to current liabilities), Capital (the ratio of total equity to total assets). *** significance at $p < 0.01$, ** significance at $p < 0.05$, * significance at $p < 0.1$. Standard errors in parentheses.

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